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HAUSA TONE[1]

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A HAUSA utterance consists of a series of segmental phonemes plus an accompanying series of supra-segmental tones. These tones are governed by definite patterns. The most frequent pattern is that accompanying simple statements. We may call this the 'narrative contour.' The boundaries of this contour we shall indicate by //. Phonemic high tone is left unmarked; phonemic low is marked with a grave accent. This contour may be stated in numbers from one to five for the five levels of tone. The number [5] will be used to indicate the highest phonetic pitch, [4] for the next lower, and so on to [1].

In these symbols narrative contour is: [1 5 3 4 2 3 1 2]; governed by the following rules:

(a) A series of two or more phonemically like tones remain on the phonetic level of the first. For example: *//ya:gayà: manì//* 'He told me.' *//wà:nenè//ya:ʔaykokà//* 'Who sent you?' (This is still narrative contour as it contains an interrogative particle.) *//ya:komo//ya:ceè//* 'He returned (and) said.' *//kaǹkà// baàšì dà kʔwalwa://* 'Your head has no brain.'

(b) A tone phrase initial or final low tone is [1]. For example: *//màykàràmbà:ni:nè//* 'He's a bothersome person.' *//mì:nenè//* 'why?' *//ya:gayà: manì//ʔinjìra:šì//* 'He told me to wait for him.' *//ʔìna: ka:jeè//bàmùganḳà bà//* 'Where did you go so that we haven't seen you?'

(c) The first phonemic high is [5]. For example: *//kàtawsèši//* 'Press him down!' *//kàta:dà:ši//* 'Get him up!' *//kay//birì://* *màybʔànna://* 'You monkey, the spoiler (of farms).' *//da:wà://ta:ša:kʔè//* 'The guinea corn didn't develop.'

(d) Otherwise every drop from high to low is two and every rise from low to high one. Hence the contour given represents an ideal phonemic sequence of low, high, low, high, low, high, low, high. For example: *//kàkwancèmu gà sarkʔà//* 'Release us from the chains!' *//munà fadʔà: dà mazà:je//* 'We were fighting with men.' *//šinà jaǹdokì://* 'He's pulling the horse.'

A tone phrase may consist of any number of successive tone units (single tones) within a contour pattern from a single high [5] to a complete pattern. This means that the whole contour need not be used but only as much of it as the succession of phonemic tones calls for. For example: *ni:* 'I.' This is the minimum representation of a tone phrase and is always [5] since every tone phrase must have at least one high. A morpheme which occurs in context with all low tone will in isolation have the final tone high. E. g. *//màcèce//* 'She is a woman.' This consists of **mace* 'woman' and *-ce* 'it (f.) is.' The enclitic *-ne/-ce* always has the opposite tone from the syllable preceding it, showing that the basic tones of *màce* are low-low. However, in isolation *màce* is given.

[1] This description is based upon the speech of a single informant, Mr. John Frank (Abdu Hassan) of New York City, a native of Katsina province in Northern Nigeria. While other statements of Hausa tone exist, none fit Mr. Frank's speech in all details. Capt. R. C. Abraham, in his *Modern Grammar of Spoken Hausa* (1941), outlines the system but leaves details to an unpublished work. In his *Principles of Hausa* (1934), he gives a more detailed discussion, but the system therein described does not fit Mr. Frank's dialect (see below). The present description is an independent treatment.

Mr. Hodge is responsible for the linguistic analysis and Miss Hause for the exact pitch of the tone involved. This study was made at the University of Pennsylvania as part of the African project of the Intensive Language Program of the American Council of Learned Societies.

A single utterance may consist of any number of tone phrase contours. The minimum utterance is one of the following: A an adverbial phrase N a nominal phrase V a verbal phrase. Each of these has its own tone phrase contour. The examples given above all consisted of only one phrase each, but an utterance may include any number of phrases from one to a filibuster, each having its own tone phrase contour. For example: *//mì: nenè//* 'What's that?' is a single phrase. *//mì: cecè//ke//* 'What's that to you (f.)?' consists of two tone phrases. *//mì:nenè//ke//kinceè ni: màywa:ri://* 'What do you mean, saying I stink?' This consists of three tone phrases: 'What is it?' 'You (f.)' 'You said I stink!' (Conversation between a vulture and a hyaena). *//likità dàgà tu:ɽay bàyzo dà komi://say ka:yankwalba://* 'the doctor from Europe didn't come with anything but a load of bottles.' This consists of two phrases, the second being 'but a load of bottles.'

To sum up, every Hausa utterance consists of one or more phrases, each with a tone contour which regulates the exact pitch of the phonemic tones.

It should be added that the precise pitch is not always hit exactly by the speaker. This is especially true of [5] after [1] or [1] in the sequence [5 1 5]. In the former [5] is sometimes flattened to [4#]. In the latter [1] is sharped to [1#] which is the same as [2]. For example: *//sarki:šinà sonk?ok?ì//tàyi ?aykìnkwìyanga://* 'The king wanted Koki to work as a servant girl.' Here a new tone phrase begins at *tàyi* but the speaker was very indifferent and only raised his pitch to [4]. It was taken in review of an old text and he was apparently bored. Miss Hause states that this happens regularly when he is bored or careless, but in normal speech this would be [1 5 5 3 3 4 4]. Other examples are: *//šinà wa:ri://kòmo bùnsuru://* 'He stinks like a goat.' *//šinà dà hak?ori://ɽòmo ku:ra://* 'He has teeth like a hyaena.' Note that after a [5] flattened to [4] the rest of the contour follows as from [4] (that is, [4 2 3 1]). As an example of [1] sharped to [2] we have *//ya:je//gìdanšàɽi:?à://* 'He went to court.' Here the high after [2] goes to [5] as it would normally.

Our conclusion is, therefore, that Hausa has two phonemic tones: high and low. Every linear morpheme in a given context has a tone pattern made up of practically any sequence of these two. Phonetically there are five levels of tone, covering a musical perfect fifth. The exact pitch is determined by tone phrase contour. There is basically one tone phrase contour, the narrative; the interrogative is a modification of this. Abraham describes two modifications of the narrative, the interrogative and the apologetic, but although our informant was perfectly willing to imitate the most abject penitent, no trace of an apologetic contour was noted. Only the narrative is here described.

Of the previous discussions of Hausa tone Captain Abraham's is the closest to the above system. In his *Principles of Hausa* he outlines a 5 3 4 2 3 1 system but rejects it in favor of one with half tones: 3 4a 2a 4 2 3a 1a 3 1 2a or (beginning with a high tone) 5 3 4a 2a 4 2. In his later book, *A Modern Grammar of Spoken Hausa* (1941) he gives only a brief outline, indicating the sequence of rises and drops without assigning numbers or other pitch symbols.[2] He correctly recognized the non-phonemic character of the variants and sets up three tones: high, low, and falling. His falling tone is here analyzed as a succession of high plus low. A long vowel with falling tone is a succession of high and low on the two moras of the vowel, which is therefore written double rather than with a mark of length. For example, *//ya:soò//* 'He loved.' When such a vowel is followed by the morpheme *n* this morpheme has the low tone. For example, *//ya:soǹkà//* 'He loved you.'

[2] I have not seen his *Phonetics and Tones of Hausa* to which he there refers.

VOCABULARY COMMON TO AKKADIAN AND SOUTH-EAST SEMITIC (ETHIOPIC AND SOUTH-ARABIC)[1]

WOLF LESLAU
ECOLE LIBRE DES HAUTES ETUDES, NEW YORK

THE PROBLEM of the dialectal relationship between Akkadian and Ethiopic aroused the interest of many scholars in Semitics. Haupt in his *Studies on the comparative grammar of the Semitic languages, with special reference to Assyrian,* published in the Journal of the Roy. As. Soc. 10. 244-51 (1878) and *Prologomena to a comparative Assyrian grammar* in The Proceedings of the American Oriental Society 1887 p. 47-65 was the first, as far as I know, to admit, on the basis of some grammatical facts and some words common to both groups, a dialectal unity of Akkadian and Ethiopic within the group of the Semitic languages.

Haupt was followed by Christian, *Akkader und Südaraber als ältere Semitenschichte,* Anthropos 14-5. 729-39 (1919-20), who adding but a few points to those mentioned by Haupt connects Akkadian and South-East Semitic and considers as "ältere semitische Sprachen" Akkadian, Minaean-Sabaean, Ethiopic, modern South-Arabic,[2] as opposed to Kanaanite, Aramaic and Arabic which belong to the "jüngeren semitischen Sprachen."

Mayer Lambert, *Le groupement des langues sémitiques,* in Cinquentenaire de l'Ecole Pratique des Hautes Etudes, 1921, p. 51-60, without mentioning the preceding articles, connects Ethiopic with Akkadian on the basis of some phonological and grammatical facts.

Hommel, *Ethnologie und Geographie des alten Orients,* p. 153 admits too, without entering into details, that South-East Semitic is related to Akkadian.

Finally Ungnad, *Das Wesen des Ursemitischen* p. 23, considers Akkadian and South-East Semitic[3] as belonging to the Oriental group as opposed to Aramaic, Kanaanite and Arabic which are Occidental languages.

The points discussed by the preceding authors in order to prove that both Akkadian and South-East Semitic formed a dialectal unity in the Semitic group will not be mentioned here.[4] They are not convincing enough to prove this assertion, as it has been pointed out by J. Cantineau, *Accadien et Sudarabique,*[5] Bull. Soc. Linguistique 33. 175-204 (1932) who concludes that there is no dialectal unity between Akkadian and South-East Semitic, but admits that both these groups might have preserved some archaic features.[6]

The situation is well summed up by Marcel Cohen, who reviewing Ungnad op. cit. in BSL 1927, p. 163 says: "Dans la masse homogène des langues sémitiques on trouve assez de phénomènes communs à toutes les langues prises deux à

[1] The following abbreviations are used below:
Bezold, *Glossar = Babylonisch-Assyrisches Glossar,* 1926.
Brockelmann, *Grundriss = Grundriss der vergleichenden Grammatik der semitischen Sprachen.*
—— *Lex. Syr. = Lexicon Syriacum,* 2nd edition, 1928.
Cerulli, *Harar = Studi Etiopici* I. *Harar.*
Delitzsch, *Prologomena = Prologomena eines neuen hebräisch-aramäischen Wörterbuches,* 1886.
Holma, *Kleine Beiträge = Kleine Beiträge zum assyrischen Lexikon,* 1912.
—— *Körperteile = Die Namen der Körperteile im Assyrisch-Babylonischen,* 1911.
Hommel, *Säugetiere = Die Namen der Säugetiere bei den semitischen Völkern,* 1879.
Landsberger, *Fauna = Die Fauna des alten Mesopotamiens* . . . 1934.
Leslau, *Lex. Soq. = Lexique Soqoṭri* (Sudarabique moderne), 1938.
Muss-Arnoldt, *Dictionary = A Concise Dictionary of the Assyrian Language,* 1905.
Nöldeke, *NBsS = Neue Beiträge zur semitischen Sprachwissenschaft,* 1910.
Praetorius, *Amh. Spr. = Amharische Sprache,* 1879.
Zimmern, *Fremdwörter = Akkadische Fremdwörter als Beweis für den babylonischen Kulturkreis,* 1914.

[2] Christian calls the modern South-Arabic languages "Mahra-Sprachen" following the terminology of M. Bittner, *Charakteristik der Šḥauri-Sprache in den Bergen von Ḍofar,* 1913, p. 14.

[3] South-East Semitic is called by Ungnad "South-Arabic."

[4] Most of the points were brought by Haupt; they were developed by Christian who added some more features common to both groups.

[5] The denomination "Sudarabique" given by Cantineau to South-East Semitic is discussed by Leslau, JAOS 63. 4 (1943).

[6] It is surprising that Cantineau attributes an importance to the ending *-a* for the "tens" in Akkadian and Ethiopic. It is without doubt that this form represents the dual-ending *-a,* and it might be developed independently in both Akkadian and Ethiopic.

deux pour supposer toutes les parentés qu'on voudra."[7] I would like to add that the same holds true of the vocabulary.

The purpose of the present article, although it deals with the vocabulary common to Akkadian and South-East Semitic, is not to prove the dialectal unity of both these groups, but it is meant to contribute to the study of the Semitic vocabulary. Added to proofs stronger than those brought by the above mentioned authors from the morphology of Akkadian and South-East Semitic it might serve as basis for further studies on the comparative field of the Semitic languages.

VOCABULARY[8]

The alphabetic order adopted is the following:

' (') *b d ḏ ḍ f g h ḥ ḫ k l m n p q r s ṣ š t ṭ ṯ w y z*.[9]

'bl: see *bhl*.

'bq: Akk. *ebqu* "(kind of) leprosy"; G. Te. *'abäq*, Tña. *'abäq̄*; Holma, *Kleine Beiträge* p. 3 considers this root as related with Ar. Aram. Hebr. *bhq*, same meaning.

'dg (*'dq*): Akk. *ediqu* "shoot," Soq. *'édog* and *'édoq* "to suck," Mh. *adôǧ*; for the relation of the meanings "to suck" and "shoot," cp. Hebr. *yoneq* "shoot" from *yånaq* "to suck."

'gy (or *gy*): Akk. *egū* "to be careless, negligent, to err, sin," G. *gegäyä, gogäwä* "to err," Tña. *gege*, Gur. *gägg^{w}a* "foolish, mad"; Dillmann, *Lexicon* 1199 compares the G. root with Hebr. *'åwå(h)* "to err," Ar. *ġawā* "to stray," but the correspondence *g* : *ġ* is not normal; besides, Dillmann himself *Lex.* 1108 compares Eth. *'ayäyä* with the Hebr. and Ar. roots mentioned above.

'kd: see *nkd*.

'kl (*'kl*): Akk. *ekēlu* "to be dark," Soq. *'okil* "to cover." For the relation of the meanings, cp. Ar. *ġaṭā* "to cover," Hebr. *'åṭå(h)* and Akk. *eṭū* "darkness." Dhorme, Rev. Bibl. 30. 387 (1921) compares Akk. *ekēlu* with Hebr. *ḥaḵlil* from *ḥkl*.

'km (*'qm*): Akk. *ekēmu* "to take away, to catch," Soq. *'ekam, 'eqam* "to reach, catch."

'ky: Akk. *akû* "weak"; Haupt OLZ 1913, col. 532 compares it with G. *'əkkuy* "bad," but cp. rather G. *tä-hakäyä* "to become languid, idle, lazy," Mh. *ha-t-kī* "to stoop." For the relation of this root with that of the other Semitic languages, see Holma ZA 28. 147 (1914).

'lf: Akk. *alāpu* "to grow," *elēpu* "plant"; Soq. *'olif* "to grow (leaf)"; for the Akkadian root, see Holma, *Kleine Beiträge* 92 ff.; Albright, JAOS 36. 228 (1916-7) translates Akk. *alāpu, elēpu* by "to bind"; see also Albright, RA. 28, p. 60 n. 5.

'lq: see *ḫlq*.

'mr: Akk. *amāru* "to see, examine," G. *'ammärä* "to show" (also Haupt), Te. *am(m)ärä* "to know"; yemenite also *'ammäz* "to show."

'mt: Littmann ZA 33. 122 (1921) compares Akk. *amatu* "word" with Har. *emädä* "to speak," but Har. *emädä* is probably a Cushitic loanword (Cerulli, *Harar* 232-3); see also *ḥmy*.

'my: see *ḥmy* and *ḫmy*.

'qm: see *'km*.

'rb(y): Akk. *erebu* "locust" (for other forms of the word, see Landsberger, *Fauna* 122), Mari *irbu*, Soq. *'erbhiyoh*, Ugar. *irby*, but also Hebr. *'arbę(h)* which, however, is considered by Zimmern, *Fremdwörter* 52, as a possible loanword from Akkadian. For this root in Akkadian, see also Holma, *Kleine Beiträge* 92 and Landesdorfer, *Sumerisches Sprachgut im alten Testament* p. 63.

'rr (*'rr*): Soq. *'er* and *'er* "to lock up, to withhold," Akk. *arāru* "to attach, catch." The meaning "to curse" in Hebr. and Akk. is a secondary one.

'rṣ: see *ḥrṣ*.

'rš (*'rz*): Akk. *arištu, urašu* "garment," G. *'arräzä* "to dress," *'araz* "dress," Gur. (Walani) *əraz*, Har. *raz*, Arg. *ras*, Amh. *əriz* "the skin of an animal serving as garment." The verb has also

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[7] In fact H. Bauer and P. Leander, *Historische Grammatik der hebräischen Sprache*, 1922, p. 8, on the basis of other morphological and lexicographical facts, arrive to the conclusion that Hebrew and Akkadian belong to the older Semitic group, whereas Phoenician, Aramaic, Arabic and Ethiopic belong to the younger group.

The special position of Akkadian as East-Semitic language as opposed to the other West-Semitic languages is also admitted by H. Birkeland, *Über die Stellung des Akkadischen innerhalb der semitischen Sprachgruppe*, in Norsk Tidsskrift for Sprogvidenskap, 7. 362-80 (1934).

[8] I wish to express my thanks to Leo A. Oppenheim for his advice in the interpretation of the Akkadian words.

[9] The names of the languages are abbreviated as follows: Ar. = Arabic, Aram. = Aramaic, Arg. = Argobba, Aym. = Aymallal, G. = Geez, Gur. =Guragué, Har. = Harari, Hebr. = Hebrew, Mh. = Mehri, Soq. =Soqoṭri, Šḥ. = Šḥauri, Te. = Tigré, Tña. = Tigriña. The 1st order of Ethiopic is transliterated by *ä*, the 4th order by *a*.

a privative meaning in Amh. *tarräzä* "to be nude," G. *'aräzä* (Nöldeke, *NBsS* 238), Akk. *erēšu* "to be nude."

'ry (*'ry*): Akk. *irru* "intestine" (Holma, *Körperteile* 83-7); the meaning of the Akkadian word might be confirmed by Soq. *'erieh*, *'erieh* "intestine" (Leslau, *Lex. Soq.* 327). Th. Bauer, *Assurbanipal* II 78 n. 1, derives the Akk. word from *erēru* "to be rotten."

'sn (*'šn*): Akk. *esennu*, *esēnu* (*ešennu*, *ešēnu*) "holiday"; is considered by Bezold, *Glossar* 52 as a Sumerian loanword, but cp. rather (with Landsberger, *Der kultische Kalender der Babylonier und Assyrier* p. 8) G. *wåsän* "terminus, finis," South-Ar. *wṯn*; in Ar. the root is *wsm* in *maṯsim*.

'ṣf: Akk. *eṣēpu* "to gather, duplicate, add," G. *'aṣäfä* "to duplicate," Amh. *aṭṭäfä* "to fold," Soq. *maṣif* "another one" (from *'ṣf*); in the other Semitic languages the root is *ṣ'f* (*ḍ'f*): Ar. *ḍa'afa*, Syr. *'āf*.

'ṣn (*ṣyn*?): Akk. *eṣēnu* "to inhale," G. *ṣenā* "odor," Te. *ṣən*.

'šf: Akk. *uššupu* "to enchant, conjure" (Syr. *'ašef* is borrowed from Akkadian); Praetorius, Literaturbl. f. orient. Philologie I. 197, suggests connection with South-Ar. *wšf* "to help"; Delitsch, *Prologomena* 141 n. is opposed to this comparison.

'yṣ (or *ḥyṣ*): Akk. *aḫaṣu* "mouse, rat" (Bezold, *Glossar* 7a translates *ayaṣu* par "Wildschwein(?), Landsberger, *Fauna* 113 par "Mungo des freien Feldes"); see also Goetze, ZA. N. F. VI, p. 296; Amh. *ayṭ*, ancient orthography *ayṣ* and *ḥayṣ* in Dillmann, *Lexicon* 780 under *'anṣäwa* (Hommel, *Säugetiere* 384, Haupt ZDMG 65. 564). It is very tempting to connect this root with the G. *'anṣäwa* "mouse," Te. *'ənṣäy*, Tña. *'ənčəwa*, but the Cushitic words: Bilin *inšuwa*, Quara *enšewa*, Saho-Afar *andawa* suggest a Cushitic origin.

b'r: Akk. *ba'āru*, *bāru* "to catch, fetch, fish," Soq. *b'r* or *b'r* (Leslau, *Lex. Soq.* 92), Mh. *bîter*, Šḥ. *biter*.

bhl: G. *bəhlä* "to speak"; is compared by Albright RA 16. 186 with Akk. *abâlu* "to respond"; for the Ethiopic root, see Leslau JAOS 63. 12 (1943.).

bll: Akk. *bulūli* "bird" or "kind of bird"; Muss-Arnoldt, *Dictionary* 167 compares it with Ar. *bulu'lu'* "kind of bird," but cp. also Amh. *bullal* "dove."

brh: Akk. *barū* "to see, look at," G. *bärha* "to illuminate," Tña. *bärhe*, Te. *bärhe*, Amh. *bärra*. In the other Semitic languages the root is *bhr* (Ar. Aram. Hebr.); Gesenius, *Handwörterbuch* 86 and Brockelmann, *Lex. Syr.* 61 compare, with some reservations, Akk. *bu'āru* "glory, joy" with *bhr*, and not with G. *brh*.

dfr: Soq. *defer* "flame" Šḥ. *defor* "to flame," Akk. *dipāru* (*ṭiparu*) "torch"; for the relation between Akk. *dipāru* and Hebr. *lappiḏ*, see Zimmern, *Fremdwörter* 36.

dmq: Akk. *damāqu* "to be clean, pure, beautiful," Ugar. also *dmq*; Littmann, ZA 25. 321 (1911) compares Amh. Tña. *dnq* (with *n*) "to be wonderful," Tña. *dənqi* "good, beautiful"; cp. also Te. *dänäqä* "to be marvellous," Gur. *adännäka-m*, *aṭänäqä* and especially Aym. *dämäqä* (with *m*) "to be agreeable." Beguinot RSO 2. 511 (1908) derives Amh. *dənq* from the root *wdq* "to fall," *wədq* > *dəq* > *dənq*. The derivation of Akk. *damāqu* from *dawaqu* (root *dqq*) "urspr. gestossen > fein, gnädig" by Christian in Calice, *Grundlagen der Aegyptisch-Semitischen Wortvergleichung* p. 42, is very doubtful.

dnn: Akk. *danānu* "to be firm, strong, powerful"; perhaps Amh. *dännänä* "to be thick, dense"; for Akk. *danānu*, see Goetze, AJSL 34. 247.

dnq: see *dmq*.

dpr: see *dfr*.

dqḥ: Akk. *daqū* "to remove"; might be compared with G. *däqḥa* "to perforate," Mh. *dūqa* "to escape, burst."

fḫr: Akk. *paḫāru* "to assemble," Mh. *faḫre* "all together," Šḥ. *faḫere*, Soq. *faḫere*, Dof. also *foḫra*, Ugaritic *fḫr* "totality"; Zimmern, *Fremdwörter* 46 derives Syr. *puḥrā* "banquet" from the Akkadian root *pḫr*.

fšḥ: Akk. *pašāḫu* "to become soothed, appeased," Tña. *fäšḥayä* "to have a placid, calm face"; Jensen ZA 4. 268 compares the Akk. root with Hebr. *šbḥ* (intensive stem) "to appease."

gg: Akk. *gūgu* "necklace," G. *gag* and *gaga*; Zimmern, *Fremdwörter* 38, asks whether the Akk. *gāgu* is not a loanword.

hny: Akk. *innu* "wheat," Soq. *héne* "to sow," related with Soq. *ine* "to be scattered"; Akk. *innu* is considered by Langdon, Babyloniaca 2. 110 (1908) as a loanword from Sumerian.

ḥmy: Akk. *amû* "to speak, think," is probably in

relation with G. *ḥamäyä* "to speak ill of," Amh. *amma*, Te. *ame* "to suspect"; for the relation of the meanings, cp. Hebr. *dibbâ(h)* "slander" from *dbb* which means in Akk. "to speak, to plan, to accuse."

ḥrṣ: Akk. *urṣu* "pestle" (see Landsberger, *Fauna* 86 n. 2), G. *ḫaräṣä* "to grind," *ḥariṣ* "flour," Tña. *ḥariṣ* or *ḥəruṣ* "flour," literally "ground," Te. *ḥariṣ*, Aym. *arəṭ*, South-Arabic *ḫrṣ*.

ḥrš: Soq. *ḥoriš* "man" compounded from *ḥor riš* "(one whose) head is black"; Akkadian, too, expresses the meaning for "man" in the same manner, it is *ṣalmat qaqqadi* "(those whose) head is black" (Müller, ZDMG 58.780).

ḥšš see *ḫšḥ*.

ḫby: Akk. (Neo-Bab.) *ḫubai* "overseer," G. *ḥabi* "administrator."

ḫlf: South-Arabic *ḫlf* "garment to cover the statue," Akk. *naḫlaptu* (Rhodokanakis, *Altsabäische Texte* I 59); Hebr. *ḥalîṗā* is perhaps borrowed from Akkadian, according to Zimmern, *Fremdwörter* 37.

ḫlq: Akk. *ḫalāqu* "to be destroyed, lost, to perish," Ugar. *ḫlq*, G. *ḫalqä* "to perish, disappear" (also Haupt), Tña. *ḫaläqä*, Amh. *alläqä*, Soq. *ʿéylaq* "to end, disappear," Ḥaḍramout *ġaliqa*; Praetorius, ZDMG 61.624 (1907) is wrongly opposed to the comparison of these roots, since the correspondence *ġ*:*ḫ* is not abnormal (see Brockelmann, *Grundriss* p. 222, 225, 227).

ḫmy: Akk. *emū* "belt, band, cover," G. *ḫamäyä* "to attach with a band," *maḫme* "band." Theoretically, the Semitic *ḫ* should be preserved in Akkadian, but the Geez root might also be *ḥmy*. It is not excluded, however, to compare G. *ḫamaya* with Akk. *ḫamū* "to seize" (as also in Albright, RA 16.182).

ḫn: Akk. *ḫānu* "part of a sacrified animal," Te. *ḥanot* "embryo," Soq. *ḥant* "belly"; also Cushitic: Bilin *hanôt*, Hamir *huĕnot*.

ḫnṣ: Akk. *ḫinṣu* "reins, hip, kidney"; has the same consonantic structure as Soq. *monḥeṣ*, with metathesis; for Akk. *ḫinṣu* see however Thureau-Dangin, Rituels Accadiens p. 49 n. 11; in the other Semitic languages, the word is: Hebr. *ḥalāṣayīm*, Aram. *ḥarāṣīm*, Syr. *ḥaṣṣā*, Arab. *ḥaṣr*.

ḫšḫ: Akk. *ḫašāḫu* "to desire, covet"; is probably an abbreviated form from *ḫšḫš*, as well as Syr. *ḥᵉšaḥ*, G. *ḥašäšä* "to inquire," Amh. *ša, əša* "to want," Har. *käšä*, Gur. *ša(m)* and *käšä*, Gaf. *wašä*. For the root 1.2.1, see Růžička, *Konsonantische Dissimilation* p. 11-4.

kb: see *qb*.

kdn: Akk. **kadānu* "to hide, protect," *kidin(n)u* "protection," G. *kädänä* "to cover,, protect," Te. *kädna*, Tña. *kädänä*, Amh. *käddänä*, Gur. *kdn* (*kdr*), Har. *kädänä*; Praetorius, BA I.25 derives G. *kdn* from Ar. *ʾik-t-anna* "to be covered"; Brockelmann, *Grundriss* 1.533 n. 3 expresses rightly doubts about this etymology.

kmr: Akk. *kamru* "heap," G. *kəmr* "heap," Te. *kämra* "to be accumulated," Amh. *kämr* "heap."

kmṣ: see *qmṣ*.

krb: Akk. *karābu* "to pray, to incline before," G. *məkʷərab* "temple," South-Arabic *mkrb*. For the problem of the relation between G. *məkʷərab* and Ar. *miḥrāb*, see Praetorius ZDMG 61.621-2 (1907), Rhodokanakis WZKM 19.297, Nöldeke, *NBsS* 52 n. 3.

krr: Akk. (Assyrian) *karāru* "to lay, to lie," Te. *karärä* "to lie."

kš: Akk. *kušū* "snake," G. *käysi*; Landsberger, *Fauna* 118 translates Akk. *kušū* by "crocodile" and compares it with Arabic of Iraq *kaṷšaǧ* "crocodile," Persian *kōs-ak*.

kšd: Akk. *kišādu* "neck," G. *kəsad*, Te. *səgad* (Haupt and Holma, *Körperteile* 37), Mh. *kensit*, Šḥ. *kensid*. The Akk. verb *kašādu* "to conquer, overpower" is probably a denominative of *kišadu* "neck," the original meaning of the verb being "to bend the neck."

-ma: Har. *-mä*, conjunction suffixed to a verb followed by another verb, serves to express a gerundive sentence, Gafat *-mä*, Akk. *-ma* (Littmann, ZA 33.103-22 (1920).

mʾ: Akk. *māʾu* "to be mighty, to surpass," G. *moʾa* "to win the victory" (Muss-Arnoldt, *Dictionary* 504). The Geez word is considered by Praetorius, Literaturblatt f. orient. Philologie I. (1884) as a loanword from Cushitic; Cerulli, *Studi etiopici* II. 213 connects also G. *moʾa* with Sidamo *moh* "to seize," Galla *mo*.

mḫr: Akk. *maḫāru* "to offer, to sacrifice," Soq. *meḥor* "to offer"; Hebr. *mᵉḥir* "price" is considered by Zimmern, *Fremdwörter* 18 as loanword from Akkadian.

mḫṣ: Akk. *maḫāṣu* "to weave," Soq. *meḥaḍ*, Har. *mähaṭä*; is a development of the Semitic root *mḫṣ* "to hit, to shoot"; Aram. and Syr. have also *mḥā* "to weave."

mt: Akk. *mūtu* "man," esp. "husband," (see also Bauer, *Die Ostkanaanäer*, p. 57), G. *mət* "man"; Ugaritic *mt* and Hebr. in the plural *mᵉṯim* and in the composition with proper nouns under the form of *mᵉṯu-* might be loanwords from Akkadian. For the existence of *mət* in Tigré, see Nöldeke, *NBsS* 146 n. 2.

mys (*myš*): Akk. *māšu* "to throw down" (see Goetze, AJSL 52 p. 154), G. *mesä* "to turn away, to bend."

n'd: Akk. *na'ādu* "to uplift, raise, praise," G. *nə'dä* "to praise" (Muss-Arnoldt, *Dictionary*), Tña. *nä'adä*.

nbl: Akk. *nablu* "flame, glow," G. Tña. *näbälbäl* "flame"; is related with the Semitic root *lhb* "to flame"; the comparison with Ar. *nabl* "arrow" made by Albright RA 16.184 is doubtful.

ndr: Akk. *nadāru* "to be fierce, rage," Tña. *näddärä* "to rage," Soq. *š-ndr* "to argue"; see, however, Brockelmann, *Grundriss* I. 178 for Akk. *nanduru* from *na'duru*.

ngr: *nāgiru* "commander, herald," Ethiopic *ngr* "to speak" (Brockelmann, *Orientalia* 8. 290); is related with the Sem. root *gr, qr* (Leslau, *Lex. Soq.* 326 under *'ry*).

nkd: Akk. *nakādu* "to be afraid," Soq. *'ékod*, also Ḍofar **ūkad* (Leslau, *Lex. Soq.* 59). For the roots with *n, ', w*, see Nöldeke, *NBsS* 179 ff.

n(y)l: Akk. *nālu, naialu* "deer," Te. *näl-ät* "female of the antelope"; for the Akkadian word, see Landsberger, *Fauna* 99.

nt': Akk. *natū* "to strike, crush, split"; Goetze, AJSL 52. 157 n. 82 compares it with Hebr. *nt'*, but cp. rather Tña. *nät'e* "to be struck, to be hurt," Har. *nätä* "to be sick," Ulbarag *näto* "sickness," Arg. *annotey* "I have a pain." The word is of Semitic origin contrarily to Cerulli, *Studi etiopici* III 80 who considers Har. *nättu* "sickness" as borrowed from Sidamo *mittana*.

pḫr: see *fḫr*.

qby: Akk. *qabū* "to say, command," Mh. *kebû* "to think," Soq. *šebe* (Bittner, *Charakteristik der Sprache der Insel Soqoṭra*, p. 6 note); Brockelmann, ZS 5. 36, however, considers with some reservations Akk. *qabū* as "reimwortbildung" to *nabū*, the *q* of *qibū* coming from *qāl*.

ql: Akk. *qallu* "servant" is compared by Holma ZA 28. 161 with G. *qʷəl'e* "servant," but Akk. *qallu* is probably to be derived from the Sem. root *qll* "to be light, without importance."

qmṣ: Akk. *qamāṣu* and *kamāṣu* "to bend the knee, to kneel down"; is very likely to be compared with Tña. *qəməṭ bälä* "to sit down," Amh. *täqämmäṭä* (G. *täqämmäṭä* is an Amharism). The relation between Ethiopic *qmṭ* and Neo-Hebr. *ḥmṭ* (Praetorius *Amh. Spr.* 67) is doubtful. Akkadian *qimṣu* "tibia, leg" is compared by Holma, *Körperteile* 137, with G. *qʷəyṣ* "tibia," but *qimṣu* is probably to be derived from *qmṣ* "to kneel down."

rwb: Akk. *rābu* "quake (of the earth)," Te. *räbräbä* "to shake"; Streck, *Babyloniaca* II. 179, compares Akk. *rēbu* "unruhig sein, zittern, erregt sein" with Sem. *rhb* (Ar. Syr.).

rd: Akk. *radū, ridū* "to pursue, to subdue," related with *radādu* "to pursue," G. *rodä* "to make an incursion"; for the Akk. root, see Landsberger ZDMG 69. 494 (1915).

rgb: Akk. *rigab/p/u* in a list of birds, G. *rəgəb* "pigeon," Amh. Te. *rəgəb*, Tña. *rəgbi*.

rt': Akk. *retû* "to erect, fortify, strengthen," G. *'artə'a* "to erect" (also Haupt), Tña. *rät'a* "to win (a case)," Amh. *rätta*, Har. *rätä'a*, Gur. *arätam* "to surpass," Soq. *riṯeh* "muscle."

s': Akk. *še'u* "measure of wheat," Soq. *se* "to measure"; Hebr. *sᵉ'ā* and Aram. *sa'tā* are considered by Zimmern, *Fremdwörter* 21 as loanwords from Akkadian. Considering the existence of this root also in Soqoṭri, the derivation of the Akk. *še'u* from the Sumerian *še* (Zimmern op. cit.) seems to be doubtful. (See also Hrožny, *Das Getreide im alten Babylonien*, p. 28, 89.) For the root in Hebr. and Aram. see also Nöldeke, *NBsS* 131.

spw: Akk. *sapū* "to pray," G. *säfäwä* "to hope," Amh. *täsfa* "hope."

spn: Akk. *sapānu* "to overpower, destroy," originally "to pass along the surface of something and remove its irregularities" (Landsberger, Bauer, ZA, Neue Folge 3. 216, n. 1 (1926), G. *säfänä* "to dominate" (Haupt); however Hebr. *sāṯan* "to cover" might also be compared with this root.

ṣd: Akk. *ṣādu* "to shine, be fiercy, brilliant, yellow," G. *ṣa'däwä* "to be white," Te. *ṣa'da*.

ṣl': Akk. *ṣelū* "to be at enmity, hostile," G. *ṣäl'a* "to hate," Te. *ṣäl'a*, Amh. *ṭälla*, Gur. *ṭäla*. According to Kraus, Archiv für Orientforschung 11. 228 (1936-7) the root is *ṣ'l*.

ṣṣ: Akk. *ṣāṣu* beside *sāsu* "moth"; the emphatic *ṣ* is also found in G. *ṣaṣe* while the other Semitic

languages have an ordinary *s*; Landsberger, *Fauna* 134 reads the Akk. word *sāsu* or *sassu* from the root *s's*; see also Zimmern, *Fremdwörter* 52.

šb/p: Soq. *śab* "foot," Akk. *šēpu*. The derivation of Akk. *šēpu* from Hebr. *pś'*, Aram. *ps'* (Jensen in Gesenius, *Handwörterbuch* 664) seems to be doubtful. Streck, *Babyloniaca* II. 218 n. 1 derives it from *šāpu* "to stamp."

šmḥ: Akk. *šamaḫḫū* "milt," G. *səmaḥ* (Holma, *Körperteile* 82 and Nachträge). There is no reason to consider the G. word as a loanword from Akkadian, as does Zimmern, *Fremdwörter* 48. Langdon, Babyloniaca 7. 186 considers Akk. *šamaḫḫū* as loanword from Sumerian.

šny: Akk. *šanū* "to make smooth, polish, repair," G. *šänäyä* "to be beautiful, to adjust," Te. *sənuy* "adjusted."

šp: Akk. *šapū* "to be dense, thick, heavy"; to be compared perhaps with G. *säfḥa* "to stretch," Tña. *säfḥe* "to enlarge," Amh. *säffa*, Ulbarag, Gogot *säfi* "large," Har. *yə-säf-zal*.

šqr: Akk. *šaqāru* (*zaqāru*) "to erect a wall," South-Arabic *h-s₂qr* "to provide with a roof" (Conti Rossini, *Chrestomathia Arabica meridionalis* 252).

šl: Akk. *šūtu* "South, South-wind," Soq. *śéte* "North, North-wind," Aram. *šūṭā* is a loanword from Akkadian (Zimmern, *Fremdwörter* 45); for the opposition of the meanings, cp. G. *samen* "South," Amh. "North," and Nöldeke, *NBsS* 62, 63. The Soq. *śéte*, however, might also be compared with Ar. *šitā'* "winter"; Tallqwist, *Studia Orientalia* 2. 107 derives Akk. *šūtu* from Hebr *šō'ā* "tempest > South-wind, South."

štq: Akk. *šatāqu* "to cut, separate," G. *šäṭäqä* "to split." The derivation of G. *štq* from Ar. *'iš-taqqa* "to split" (Praetorius BA 1. 25) is doubtful.

šṭq: see *štq*.

šṭṭ: Akk. *šaṭāṭu* "to split," G. *šäṭṭä* "to split," but also Ar. *šaṭṭa* "to remove."

tb': Akk. *tibū* "to rise against," *tēbū* "agressor, enemy," G. *täb'a* "to be strong, audacious," *təbu'* "viril, strong," *täba'i* "bellicose," Tña. *täb'e* "to be intrepid, courageous," Te. *täb'a*, Amh. *täbat* "male," Čaha *täbbam* "to be strong." For this root in Cushitic, see Cerulli, *Studi etiopici* II. 210 under *labba*.

tl': Akk. *tulū*, *tilū* "breast (of the female)," G. *täla'* "breast of the animal" (Haupt, and Holma, *Körperteile* 46). There is no reason to separate these words as does Delitsch, *Prologomena* 41, n. 1. Dhorme, Revue Biblique 31. 231 (1922) compares Akk. *tilū* with Ar. *tal'* "elevation."

twy: Akk. *ta'ū* "to eat," Mh. *towū*, Šḥ. *te*, Soq. *te* (Leslau, Mémoires de la Soc. Linguistique 23. 409 (1935); Egyptian also *t³* "bread" (Zeit. Aegyptologie 50. 89).

ṭpr: see *dfr*.

ṯhr: the meaning of this root is "back" in Semitic; in Akkadian and South-Arabic it has the meaning of the preposition "above, on": Akk. *ṣēr*, Soq. *ṯhar*, Šḥ. *ṯer*, Mh. *ṯəyr*, South-Arabic *b-ṯhr*; also Ugaritic *b-ṣr*.

zḫl: Akk. *zaḫālū* "gold copper alloy"; is compared by Muss-Arnoldt, *Dictionary* 277 with G. *zaḥəl* "rubigo, aerugo, ferrugo."

zmb: Akk. *zumbu* "fly," as in Amh. *zəmb*, with *mb* < *bb* of the other Semitic languages.

A SALISBURY LETTER

FRANKLIN EDGERTON
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HERE IS presented an unpublished letter from Edward Elbridge Salisbury (April 6, 1814–February 5, 1901). He was probably a foundation member of this Society; there seems to be no recorded list of them, but he was already a professor at Yale at the time of the foundation, and at any rate he was included in the earliest known List of Members (JOURNAL 1, p. xi). He was certainly one of the most prominent and active members in the early days. He was Corresponding Secretary 1846-1857, and President 1863-1866. Having refused reelection in the latter year, he was made one of three Vice Presidents, and held this office for many years. On his life and work see most recently the

Dictionary of American Biography xvi. 308, and *Proceedings of the American Philosophical Society* 87 (1943). 32. It has been said that his greatest service to scholarship consisted in his launching James Hadley and William Dwight Whitney on their scholarly careers. But his own scholarly publications were very far from negligible in quantity or quality.

The letter has been presented to the Library of Yale University by its recipient, Mr. George Grant MacCurdy, who later became Research Associate (with the rank of Professor) in Prehistoric Archaeology and Curator of Anthropology in Yale (now Emeritus). It is published in the belief that it will interest many members of the Society and readers of its JOURNAL. It throws much light on the personality of Salisbury himself; and it contains shrewd and penetrating comments on other early orientalists whom he knew, chiefly as his teachers.

Only the signature of the letter is in Salisbury's own handwriting. For many years his eyesight had been so poor that he had been forced to use an amanuensis, who both read to him, and wrote at his dictation. The original spelling and punctuation of the letter have been scrupulously preserved, except as indicated in footnotes 5 and 11. It is certain that Salisbury was not responsible for the spelling of the city-name Bonn with a single n, and at least probable that he knew how Horace Hayman Wilson spelled his middle name. I have made no other editorial alterations; any reader may speculate as well as I as to whether, if Salisbury had done his own writing, he would have spelled or punctuated differently in other respects.

New Haven, Dec. 23rd 1894

Dear Mr. MacCurdy,

I was about to begin this letter by explaining the riddle of that seal which had exceeded your comprehension, when now to-day comes word from you that the puzzle is solved.[1] It only remains for me, therefore, to warn you that such stealings cannot be continued long with impunity; for does not Scripture say: "Wo unto you when all men speak well of you?"

But my main purpose is to reply somewhat fully to your expressed desire to know more of the way in which I was led to take up what have been the leading studies of my life. I do this the more willingly for three reasons: first because you ask it, secondly because Mrs. Salisbury leaves so few subjects for me to write about; and thirdly because I do not know to whom I could write on this subject, so personal to myself, with more confidence that I should not be misunderstood than to yourself, who by so strange and so strangely rapid a course of events have come to be to us almost in the relation of a son.[2]

Well then, to begin. I had taken my first degree at Yale when I was only eighteen and a half years old, and returning with my mother after that to Boston, the home of my father's family, and of allied families for several generations, had pursued private studies there for a year, when my sister's marriage to Mr. Woolsey[3] (afterwards President of Yale) brought my mother back to New Haven to make a separate home for herself here for the rest of her life, and I too came back and went through a full course of theological studies at Yale. I have always thought that my whole life would have been happier had I entered upon those studies with a truly Christian purpose to serve God and my fellow men in the humble work of a country parson, and had followed that purpose to the end. But I did not so. When I was about twenty-two and a half years old I married a first cousin of mine, a very lovely woman of about my own age, having in her own right a large fortune for those days, and had, meanwhile, received from my mother a handsome portion of my father's estate. We younglings, therefore, were amply provided for, and could follow freely our fancies and tastes. We chose to go abroad for travel and self-improvement, and our friends and relatives approved of our choice, and gave us "God speed" as we threw ourselves with all the abandon of inexperience in the ways of the world upon the wide ocean and the wider

[1] Mr. MacCurdy is at present unable to recall the matter referred to here.

[2] Mr. and Mrs. Salisbury (she was his second wife; her maiden name was MacCurdy) had recently begun to take a parental interest in the scholarly career of young Mr. MacCurdy, an interest which remained active throughout both their lives, and which they had the great satisfaction of seeing justified by results.

[3] Theodore Dwight Woolsey (1801-1889); see *Dict. Amer. Biog.* xx. 519 f. He was an active member of the American Oriental Society, and succeeded Salisbury as its President 1866-71. He was married on Sept. 5, 1833, to Elizabeth Martha Salisbury, who died Nov. 3, 1852, after bearing him nine children.

expanse of a new life in foreign climes. This was a turning point. While studying theology I had come under the teaching of Prof. Gibbs,[4] who instructed in the interpretation of the Hebrew and Greek Scriptures, and had felt his influence somewhat more than was usual with his pupils. He was a learned man, but not inspiring to most of his pupils—it used to be said of him that he would give the opinions of all other scholars on some point, but never express his own. He had, however, one enthusiasm, which was for the study of comparative philology, on which he wrote and printed a vast deal of fugitive lore. Some of that was, I think, the first seed dropped into my mind which determined my later course of study, so, when I first went to England, and visited Oxford I had a curiosity (perhaps it was nothing more) to see Prof. Horace Hayman Wilson,[5] the leading Sanscrit scholar of his day in England, whose specialty lay at the foundation of the new science of comparative philology. He had been, I think, in the service of the East India Co. in India, at all events his great work, a Sanscrit dictionary, now a book rarely to be seen, and entirely superseded for use, was printed and published in Calcutta. I introduced myself to him and was kindly received, and carried away from the visit a new impression of the reality of the new science. The winter of 1836-37 was passed in Italy and given to art studies. But the next winter after that we were in Paris, where an introduction to Prof. Garcin de Tassy[6] a learned Hindustani scholar, also familiar with the Arabic, and the continued presence and teaching at the Sorbonne of the venerable De Sacy,[7] led me to take up the study of Arabic, partly "privatim." De Tassy was a sprightly and vain little Frenchman, but most good natured, complaisant and helpful to a beginner like myself, while De Sacy, a truly saintly Jansenist in spirit, won all hearts by his perfect learning communicated with the gentlest mildness. That winter, however, was his last, and when, after another winter, in the spring of 1839, his manuscripts and books were sold at auction, I bought of both to a large amount, as memorials of him and as the nucleus of an Oriental library. Thus were laid the rude and imperfectly jointed foundations of my Semitic studies.

The last winter of our first residence in Europe we spent in Berlin, where the great attraction was Prof. Bopp[8] the leading Sanscritist of his time in Germany, whose "Comparative Grammar" was supposed to be the key to all the mysteries of the comparison of languages. I attended his lectures, and had private instruction from him. He was a pleasant gentleman with a complacent yet modest sense of his high position in the world of learning—on whom all European scholars were in attendance so to speak, waiting to see what new combinations he might contrive to unlock farther the secrets of the new science. Leaving Berlin, we came home by the way of Paris. The literary treasures I had accumulated attracted much attention, and both old friends and new came to browse in my fresh pastures, among whom the chief were Prof. Gibbs and the poet Percival,[9] himself a devoted student of language and languages. This was in the summer of 1839. In 1841 I was made Professor of Arabic and Sanscrit at Yale—an absurdly named professorship, for to worthily cover such a broad field, one must have mastered all languages of civilized man, with the exception of the Turanian. I read an inaugural address in which I tried to define my field, and avowed that I had only surveyed it in advance of cultivation. But the pretension implied in my professional title, I think, discouraged me from the first; and, meanwhile, domestic and social engagements diverted my mind from pursuing the course marked out. I never advanced much beyond the position where I stood at the start, and not being able to keep the sources filled up I never

[4] Josiah Willard Gibbs (1790-1861), from 1826 Professor of Biblical Literature in Yale; see *Dict. Amer. Biog.* vii. 247 f. He was the father of the celebrated physicist (Josiah) Willard Gibbs (1839-1903).

[5] 1784-1860; the first Boden Professor of Sanskrit at the University of Oxford. See Ernst Windisch, *Geschichte der Sanskrit-Philologie und indischen Altertumskunde* (2 Parts, Strassburg, 1917, 1920), 36 ff.—In the original letter the middle name is spelled "Haymon."

[6] 1794-1878; Professor of Hindustani in the École des Langues orientales vivantes. See Windisch, *op. cit.*, 143 and 441.

[7] Baron Silvestre de Sacy (1758-1838); see the *Biographie générale* 42 (1863). 987 ff.

[8] Franz Bopp (1791-1867), author of the first comparative grammar of the Indo-European languages; see Windisch, *op. cit.*, 67 ff.; H. Pedersen (transl. J. Spargo), *Linguistic Science in the Nineteenth Century* (Cambridge, Mass., 1931), 241 ff.

[9] James Gates Percival (1795-1856); see *Dict. Amer. Biog.* xiv. 460 f. He was noteworthy as a geologist and as a linguist, as well as "the ranking American poet until the appearance of Bryant's *Poems* (1832). . . . Unyielding and eccentric, utterly impractical and living alone with his ten thousand books, he was one of the most learned men of his time" (*loc. cit.*).

really welcomed any aspirants to take from me what little I knew. Mr. Whitney came across my path at length, and I embraced the first opportunity to cast the burden of my literary responsibilities upon him, and after a while obtained a complete discharge.[10] But I have anticipated. After my appointment at Yale, we went abroad for the second time, directing our course to Bonn [11] on the Rhine, where were stationed, as professors in the University, Freytag [12] and Lassen.[13] The former was a rather rough specimen of humanity; but was the author of a great Arabic Lexicon which embodied all the Arabic learning of his day. He was dogmatical in his disposition, but accurate and fully possessed of what he knew, and he was "facile princeps," but as his pupils laughed at his farm in the neighborhood of Bonn, calling it "Arabia Deserta," so one could not expect to find any flowers of literature springing up in his paths. The latter man of Bonn whom I have named—Lassen, was distinguished as the first who gathered together the fruits of the new study of India, made possible by increasing knowledge of Sanscrit and its literature, in an attractive readable form under the title of "Indische Alterthumskunde." We became good friends.

You see, by this time, that your inquiry started a stream which now threatens to overwhelm you. I will soon dam it up again, and end my story. I could not well have written less, if I were to give you any idea of the springs of action which moved me in my taking up & pursuing so far as I did the study of Oriental languages and literature. As concerns personal achievement in that direction, my life has been a failure—owing, perhaps, in fact, to an original mistake in the abandonment of the sacred profession which was my first choice.

It is too late for Christmas greetings but the New Year is a longer anniversary. So I am in time to express my sincere wishes that the year 1895 may be to you richer in fruits of enjoyment and profit, and brighter in hopes for the future than any preceding year.

Sincerely your friend

E. E. Salisbury

[10] In 1854 Mr. Salisbury retired from the Sanskrit half of his professorship in favor of William Dwight Whitney, his former pupil, who had meanwhile continued his studies in Germany. In 1856 he gave up the Arabic chair also, but continued for years to publish valuable scholarly works, especially in the Arabic field (see his biography in *Dict. Amer. Biog.*, cited above). When failing eyesight made him dependent on others, he took up genealogical studies, and with the able assistance of his second wife published extensively in that field.

[11] In the original letter spelled "Bon," here and below.

[12] Georg Wilhelm Freytag (1788-1861); see *Allgemeine deutsche Biographie* 7 (1878). 373 f.

[13] Christian Lassen (1800-1876); see Windsch, *op. cit.*, 154-158, and 164-197. The latter section, containing five successive chapters, consists of an exhaustive and instructive analysis of Lassen's great work, *Indische Alterthumskunde*, which is referred to by Salisbury below.

OBSERVATIONS ON CITY PANEGYRICS IN ARABIC PROSE

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ARABIC *Kunstprosa* seems to be using (at least) three different styles in the panegyrical description of cities.

(A) The first strings together nouns with a genitive attached to each, those nouns being predicated of the object described; e. g.

Baġdâd
umm ad-dunyâ
wa-sayyidat al-bilâd
wa-jannat al-arḍ
wa-madînat as-salâm
wa-qubbat al-islâm
wa-majma' ar-râfidain
wa-ma'dan aẓ-ẓarâ'if
wa-manša' arbâb al-ġâyât . . .[1]

[1] al-Qazwînî, *Cosmography*, ed. F. Wüstenfeld, Göttingen, 1848-9, 2. 209. A Greek example of this style: Amphilochios, Bishop of Iconium (ca. 374--ca. 394), friend and correspondent of Basilios the Great and Gregory of Nazianz, *Homily* I, ch. 1, *MPG*, 39. 36:

. . . νοητοῖς καὶ ἀρρήτοις . . . μυστηρίοις, ὧν
κρηπὶς ἡμῖν ἀρραγὴς
καὶ θεμέλιος ἀστεμφὴς
καὶ ἀρχὴ σωτήριος
καὶ κορυφὴ πανσεβάσμιος . . .

Cf. E. Norden, *Die antike Kunstprosa*, Leipzig and Berlin, 1915-8, p. 855.

(B) The second produces passages in which each feature of the object described is presented in a brief colon forming a complete sentence with subject and predicate noun but always without a verb; thus, e. g., Ibn al-Mu'tazz (d. 908), speaking of Samarra:

kaukabu-hâ yaqẓân
wa-jawwu-hâ 'uryân
wa-ḥaṣbâ'u-hâ jauhar
wa-nasîmu-hâ mu'aṭṭar
wa-turâbu-hâ aḏfar . . .[2]

The rhyme and the equal length of the cola are incidental and have no bearing on this classification of styles.

(B) is a favorite of the early hortatory *ḫuṭba*; cf., e. g., the harangue ascribed to the caliph 'Alî, Yâqût, 1. 647.

Both (A) and (B) may be amplified, (A) by adding a second genitive (as in the last line of the above example, (B), e. g. by introducing an elative as the predicate noun; cf.:

hawâ'u-hâ alṭaf min kull hawâ'
wa-mâ'u-hâ a'ḏab min kull mâ'
wa-turbatu-hâ aṭyab min kull turba
wa-nasîmu-hâ araqq min kull nasîm . . .[3]

It need hardly be stressed that longer passages are not usually confined to the use of one type of clauses.

It is noteworthy that the description through an asyndetic sequence of either (a) adjectives or (b) nouns with a genitive, so characteristic of descriptions of persons, both physical and moral, is entirely absent when cities are held up to praise or blame. Instances of both types of personal characterization abound.[4]

The restriction of this stylistic pattern to the description of individuals is traceable to its origin in the *eikonismós* of post-classical Greek (and Roman) literature, which, in turn, has been found to originate in the peculiar, passport-like technique exhibited in Ptolemaic papyri since the third century B. C. The formulae in the papyri again are influenced by the terminology of the physiognomists.[5] This reluctance to use a stylistic pattern in a genre for which it was not traditionally designed is again proof of the tenacity of the genre distinctions and of the identification of the individual genre with certain peculiarities of style—long after the reason for such distinctive treatment had been forgotten.

Eulogies on cities in Arabic literature are comparatively rare and, on the whole, brief. The subject was, very naturally, not one to present itself to the Arabs during their classical, that is, their pre-Islamic period. This will account for two facts.

First, that there was no special style developed for city description. Styles (A) and (B) can, so the author hopes to prove elsewhere, be traced to the style, or styles, of Christian hymnology and related literature.[6] Style (B), in addition to hymnological affiliations, is derived from older types of addresses and sermons, both Arabic and non-Arabic. And style (C), which requires further analysis, can be followed in Arabic prose long before city eulogies appear.

The other fact concerns the resumption of the Greek sophists' rules for the praise of a city by the (probably) only Arabic author to present us with an extended panegyric of this kind.[7]

[2] Yâqût, *Mu'jam*, ed. F. Wüstenfeld, Leipzig, 1866-73, 1. 690. A Syriac instance: Eustathios, Monophysite Bishop of Antioch in Pisidia, *fl. ca.* 435, *Homily on the Nature of Our Lord*, ed. F. Nau, *Patrologia Orientalis*, 13 (Paris, 1919) 174[3-4].

[3] Continuation of the above quotation from Qazwînî.

[4] For (a) see e. g. Ibn aṭ-Ṭiqṭaqà, *Kitâb al-faḫrî*, ed. W. Ahlwardt, Gotha, 1860, p. 137[11], 245[8-9], 265[10-13], a. o.; for (b) e. g. Abû 'l-Faraj al-Iṣfahânî, *Kitâb al-aġânî*, 3rd ed., Cairo, 1927 ff., 1. 12, 3. 286, 4. 287 f., a. o.

[5] On the *eikonismós* cf. J. Fürst, *Philologus*, N. F., 15 (1902) 374 ff., 593 ff. A late Latin example provides Ambrosius, *De virginitate*, II, 1, 7 (quoted by Augustine, *De Doctrina Christiana*, IV, 48). On its occurrence in poetry see the author, *Orientalia*, n. s., 8 (1939) 329 f., in the prose of the *ayyâm* tales, W. Caskel, *Islamica* 3 (1931), Supplement, pp. 37 f., and the author, *JAOS* 62 (1942) 286, note 87. The Hellenistic origin of this technique is strikingly evidenced by the description of Zenon's looks in al-Mubaššir b. Fâtik's (ca. 1050) *Muḫtâr al-ḥikam* (the passage is edited by F. Rosenthal, *Orientalia*, n. s., 7 (1937) 32). Already F. Boll, *Jbb. f. class. Philologie*, Supplementbd. 21 (1894) 60-3, has shown the survival of Greek physiognomics in one specific instance, viz. the sketch of Ptolemaeos' looks in al-Mubaššir's book.

[6] The term *hymn* is here to be understood in the wider meaning given it by E. Norden, *op. cit.*, 844 ff. Already A. Mez, *Renaissance of Islam*, London, 1937, p. 323, note 3, recognized the survival in Muslim homiletics of the Christian sermon as developed in Greek during the early centuries of our era.

[7] For other instances of adoption of classical elements into Arabic literature as well as for the method leading to the establishment of such transmission, cf. the writer, *JAOS* 62 (1942) 290-2. An additional instance provides the resumption by Ibn ar-Râwandî (d. *ca.* 865) of the

This most beautiful and at the same time also most elaborate eulogy of a city, the 50th *maqâma* of al-Ḥarîrî (d. 1122), provides another perfect example of the stubborn persistance of certain parts of the classical canon, this time with respect to an important category of epideictic literature.[8]

Basing our comparison on Menander, Περὶ ἐπιδεικτικῶν,[9] we find a few omissions, partly due to the Islamic milieu and partly to the comparative briefness of Abû Zaid's address. The four parts of a city encomion as presented by Menander on the basis of Aristeides' orations can be followed easily.[10] Al-Ḥarîrî trespasses only once, by placing Part 2, the τόπος ἀπὸ γένους, in the middle instead of at the end of Part 1, the praise κατὰ φύσιν ἢ κατὰ θέσιν.[11] In addition to the agreement in structure there is in al-Ḥarîrî as well as indeed in all specimens of Arabic city eulogies that same studied aversion to the mention of specific facts that is so characteristic of the Greek genre.

Thus, then, addresses Abû Zaid of Sarûj the Baṣrians on the virtues of their town.[12]

Introduction. "O ye people of Baṣra! may Allâh keep and guard you, and strengthen your piety; how far spread is the fragrance of your fame, and how surpassing are the virtues that distinguish you."

As required by classical theory, al-Ḥarîrî now takes up first the praise κατὰ θέσιν καὶ φύσιν.[13]

"Your country is the most eminent of countries in purity, the richest of them in natural gifts, the widest in expanse, and the most fertile in pasture-grounds; she boasts over them the correctest *qibla*, the broadest stream, the greatest number of rivers and date-palms, the most exquisite beauty in detail and aggregate, being the gateway to the sacred land and fronting the door (of the Ka'ba) and the station (of Abraham), one of the two wings of the world."

A short passage on the second *topos*, that ἀπὸ γένους, follows. Al-Ḥarîrî restricts himself to Point

Hellenistic *topos* to attribute philosophical arguments of a certain rationalistic or skeptic hue to the Brahmins; cf. P. Kraus (at H. H. Schaeder's suggestion), *RSO* 14 (1934) 356, and the literature there quoted. A comparable break in the literary documentation of the reception by the Muslim world of a Hellenistic tradition occurs in the history of astrological magic; cf. e. g. H. Ritter, *Islam* 24 (1937) 285, Brockelmann, *GAL*, Suppl., 1. 431 (with notes), and the literature there listed. The treatment accorded the schoolmaster in Hellenistic and in Arabic literature constitutes one more interesting example of the same process. In connection with such literary survivals the opinion of V. F. Büchner, *EI* 4. 1022b, *s. v.* *'Unṣurî*, may be worth recording. In discussing the origin of 'Unṣurî's (d. 1049) romantic epic *Wâmiq and 'Aḏrâ* Büchner states: ". . . the subject of the poem is the final union of two lovers in spite of all obstacles. This very subject is the main theme of the Hellenistic romances of the early centuries A. D. We may perhaps assume that there were free versions of such romances in Pahlavî literature (which came through Syriac) and that the original story of Wâmiq was based on a work of this kind. The matter must of course have been adapted to the East and Muslim authors must have later contributed their share." Note also J. Hell's observations on Hellenistic elements in the love-songs of al-'Abbâs b. al-Aḥnaf (d. between 803-813), *Islamica* 2 (1926/7) 304 and 306 f.

A striking case of style survival over centuries in which this particular mode of expression is not evidenced anywhere is supplied by Gregory of Nazianz (d. *ca.* 389 A. D.), whose Λόγος πρὸς παρθένον παραινετικός according to the Greek scholiast "resumes" (μιμεῖται) the style of Sophron (5th century B. C.) in his *Mimes*; cf. Norden, *op. cit.*, 46-7.

[8] H. Ritter, *Über die Bildersprache Niẓâmîs*, Berlin and Leipzig, 1927, p. 20, notices a certain similarity between the Arabic *faḍâ'il* literature and the γένος ἐπιδεικτικόν in general.—The Greek treatment of city panegyrics is summarized by R. Volkmann, *Die Rhetorik der Griechen und Römer*, 2nd ed., Leipzig, 1885, 333-5. Neither Quintilian, *Institutiones*, III, 7, 26-7, nor Dionysios of Halikarnassos, *Techne*, I, 3 (*Opuscula*, ed. Usener-Radermacher, 2. 257), or Syrianos, ed. H. Rabe, Leipzig, 1892, 2. 177 ff., are as helpful as is Menander's well organized and detailed treatment. C. T. Burgess, *Epideictic literature*, Chicago, 1902, p. 110, unfortunately summarizes Menander's 23 pages on no more than 11 lines.

[9] In L. Spengel, Rhetores Graeci, Leipzig, 1853-6, 3. 329 ff. Burgess, *op. cit.*, 107, note 1, gives a succinct account of the discussion concerning the authorship of the treatise.

[10] Menander 346. 26-31: οἱ τοίνυν περὶ τὰς πόλεις ἔπαινοι μικτοί εἰσιν ἀπὸ κεφαλαίων τῶν περὶ χώρας εἰρημένων καὶ τῶν περὶ ἀνθρώπους. ἐκ μὲν γὰρ τῶν περὶ χώρας τὴν θέσιν λεπτέον, ἐκ δὲ τῶν περὶ ἀνθρώπους τὸ γένος, τὰς πράξεις, ἐπιτηδεύσεις; in the following, however, Menander puts the πράξεις after the ἐπιτηδεύσεις, and so does al-Ḥarîrî.

[11] Al-Ḥarîrî's trespassing of the rules at precisely this point may be explained by the fact that another trend of classical theory places the celebration of the city's origin before that of its situation: Dionysios, *Techne*, V, 5 (Usener-Radermacher, 2. 275). A. Boulanger, *Aelius Aristide*, Paris, 1926, p. 343, note 4, appears to have misunderstood Menander's arrangement.

[12] The translation quoted is by F. Steingass, *The Assemblies of al-Ḥarîrî*, London, 1898, 2. 176-8, corresponding to pp. 401 f. of Steingass' edition of the Arabic text, London, 1897.

[13] Cf. Menander, pp. 347[2] ff., and also what is said about the praise of a χώρα, pp. 344 ff. The particular location of Baṣra corresponds somewhat to that of Kyzikos which accounts for one or the other remote similarity of Abû Zaid's description with that of Aristides in his Πανηγυρικὸς ἐν Κυζίκῳ περὶ τοῦ ναοῦ, *Opera*, ed. G. Dindorf, Leipzig, 1829, 1. 382 ff.

2 of the five in which Menander [14] divides this part, and instead of their descent as Menander would [15] al-Ḥarîrî boasts of the Baṣrians' piety.

"A city founded on the fear of Allâh, that never was defiled by flames of the fire, whose people never circumambulated idols, and prostrated themselves on her ground to none but the Merciful."

In this manner al-Ḥarîrî also very subtly turns the comparative youth of the city into a reason for pride as it was never soiled by heathen superstition and this in exact correspondence with Menander's prescription: [16] it must be shown that, with regard to religious standing (*σεμνότητι*), the more recently founded cities are by no means inferior to the older ones.

Al-Ḥarîrî now proceeds to the topic of referring to those buildings that constitute one basis of civic pride, again in exact harmony with Menander.[17]

"Possessed of shrines much visited and of mosques thronged with worshippers, of schools far celebrated, and of tombs resorted to by pilgrims, of monuments revered and enclosed precincts."

A statement with the character of a summary concludes Part One.

"In it meet the ships and the saddlebeasts, the fish and the lizards, the camel-driver and the sailor, the hunter and the tiller, the harpooner and the lancer, the herd and the swimmer, and to it belongs that spectacle of the tide that rises and the tide that ebbs." [18]

Al-Ḥarîrî now turns to Part Three, the praise *ἀπὸ ἐπιτηδένσεων*, the glory deriving from the city's achievements and way of life. In accordance with Menander's canon, he first remarks on the harmony between governing and governed.[19]

"Your community are the most obedient lieges of their prince,[20] and the most grateful for benefits bestowed on them."

As suggested in Menander's outline, al-Ḥarîrî then emphasizes the scholarly contributions of Baṣra.[21]

"Your ascetic (i. e., al-Ḥasan al-Baṣrî, d. 728) is the most devout of mankind, and the brightest light on the road to truth; your scholar (i. e., Abû 'Ubaida, d. *ca.* 825) the most learned of all ages, and the supreme authority for all times; and from amongst you came forth he who created and laid down the lore of grammar (i. e., Abû 'l-Aswad ad-Du'alî, d. *ca.* 688/9), and he who devised the measures of poetry (i. e., al-Ḫalîl b. Aḥmad, d. 791); and there is no boast of man, but to you belongs the foremost hand in it, and the winning arrow; there is no glory, but ye are the most worthy of it, and the most deserving." [22]

Menander has the encomion *κατὰ τὰς ἐπιστήμας* followed by praise *κατὰ τὰς τέχνας* and *κατὰ τὰς δυνάμεις*, the latter including [23] rhetoric and athletics. The *mu'aḍḍin*, to whom al-Ḥarîrî devotes the next passage, is doubtless a *τεχνίτης*, to both the Greek and the Arab mind. In the original this paragraph is of surpassing beauty.

"Withal ye have *mu'aḍḍins* far more than the people of any town, and in worship ye observe the nicest rules, and from you pattern is taken in performing the ceremonies of 'Arafât, and become known the morning bounty in the sacred month, for when the slumbers are still and the sleeper is soundly asleep, there is heard amongst you a recitation that rouses the somnulent, and rejoices the wakeful, and the smile of morning dawns not, nor breaks forth its light in season hot or cold, but the prayer-call summons you with a murmur, like the murmur of the wind on the sea-waves."

The fourth and last part of this type of oration deals with the *πράξεις* of the town,[24] the deeds of its people in history and legend, to which is joined the enumeration of the honors accorded it by kings, statesmen, and celebrities in general.[25]

In this vein al-Ḥarîrî bestows on Baṣra the high-

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[14] Pp. 353 ff.

[15] P. 353, ult.

[16] To Point 3 of Part 2, p. 355. 8-10.

[17] P. 352; cf. also Quintilian, *Inst.*, III, 7, 27.

[18] Abû 'l-'Alâ' al-Ma'arrî (d. 1057), in his *Letters*, has two passages on his home town that constitute excellent instances of the *ψόγος* of a city: *Letter* 1, pp. 7 f., and *Letter* 20, pp. 55 f. (trans. pp. 8 and 61 respectively) in the edition of D. S. Margoliouth, Oxford, 1898. Al-Ma'arrî deals only with the *τόπος κατὰ φύσιν καὶ θέσιν*. It is not here suggested definitely that he, too, was affected by sophistic tradition, but the possibility can hardly be excluded.

[19] Menander, p. 360. 10, 11: *δεῖ δέ νομίζειν περὶ πολιτείας, ἄριστον εἶναι τὸ ἑκοῦσαν, ἀλλὰ μὴ ἄκουσαν ἄρχεσθαι τὴν πόλιν.*

[20] *sulṭân*; Steingass has "Lord" which is misleading.

[21] Menander, p. 360. 17-20: *αἱ δὲ κατὰ τὰς ἐπιστήμας ἐπιτηδεύσεις, εἰ κατὰ πόλιν εἴησαν εὐδόκιμοι, ἀστρολογία καὶ γεωμετρία, ἢ μουσικὴ, ἢ γραμματικὴ, ἢ φιλοσοφία· αἱ γὰρ τοιαῦταί εἰσιν αἱ κατ' ἐπιστήμην ἐπιτηδεύσεις.*

[22] Cf. the corresponding *ψόγος*, when al-Ma'arrî, *Letter* 24, p. 61[7] (trans. p. 67) complains that he was born in a place where there were no scholars.

[23] P. 361[1].

[24] Menander, pp. 362 ff.

[25] Menander, p. 365. 10-12: *δοκεῖ δὲ ἴδιος τόπος εἶναι παρὰ τούτους ὁ ἀπὸ τῶν τιμῶν, ὧν τετυχήκασιν αἱ πόλεις παρὰ βασιλέων ἢ ἀρχόντων ἢ γνωρίμων ανδρῶν . . .*

est praise conceivable in Islam by reciting the virtues ascribed to the city by the Prophet even before it had been founded (at the behest of 'Umar, in 637 or 638). No more impressive peroration could have been devised by a Muslim speaker.

"Wherefore Tradition has disclosed concerning you, and the Prophet, be peace upon him, has declared aforehand that your murmur in the mornings would be like the murmur of the bees in the deserts; honor then to you for the prediction of the chosen one, and hail to your city, though it be effaced and naught remain of it but the outline." [26]

[26] The above remarks need supplementation from two main viewpoints: the relation of Arab city eulogies in prose with eulogies in verse will have to be studied as well as that of the Arab theory (and the artistic practice) of *waṣf* with the Greek theory of the ἔκφρασις.

In this connection the observation may be significant that the famous Arabic city histories, such as Abû Nu'aim al-Iṣfahânî's *Ta'rîḫ Iṣfahân* or al-Ḫaṭîb al-Baġdâdî's *Ta'rîḫ Baġdâd*—brief description of the city followed by the enumeration of celebrities born in or otherwise connected with it—appear to have classical models. Philon of Byblos, under Hadrian, wrote a lexicon of cities under the title Περὶ πόλεων καὶ οὓς ἑκάστη αὐτῶν ἐνδόξους ἤνεγκε. Strabon, too, has lists of famous men, arranged κατὰ πόλεις, "according to cities."

ASSYRO-BABYLONIAN AND ISRAELITE MEASURES OF CAPACITY AND RATES OF SEEDING

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SEVERAL ATTEMPTS have been made to determine the cubic contents of the qa, the most common measure of capacity among the Semites of the ancient Near East. Thureau-Dangin was the first to examine the problem when, in 1903, he believed to have found in the silver vase of Entemena a graduated vessel containing 10 qa.[1] A second opportunity to investigate into the size of the qa-measure presented itself to the same author in a ritual text from the Neo-Babylonian period which contains a reference to the 'sûtu of 10 minas.' On the assumption that ten minas was the weight of one sûtu of water, he determined the qa at 0.84 liters.[2] Thureau-Dangin's latest attempt, based on a series of stereometrical school-texts, led him to the conclusion that the qa was equal in size to the 125th part of a cube cubit, or 0.97 liters.[3] The very divergence of these results neither of which confirms the other warrants a reconsideration of the whole problem all the more since the measures of capacity occurring in non-Babylonian sources such as the Middle Assyrian documents and the texts from Nuzi have been disregarded in the previous investigations.

From the methodological point of view, the reference in the aforementioned ritual text [4] to a sûtu weighing 10 minas offers, among the data drawn upon by Thureau-Dangin, the most trustworthy source of information.[5] In order to exploit

[1] The measure so determined contained 0.415 liters: see *ZA* 17. 94 f. (1903); cf. *Journal Asiatique* 13. 90 ff. (1909).

[2] See *Rituels Accadiens* 81, note 3 (Paris, 1921); *RA* 18. 131 f. (1921).

[3] See *RA* 34. 80 ff. (1937).

[4] The text, which is preserved in the Louvre Museum, bears the inventory number AO 6451; latest edition by Thureau-Dangin, *Tablettes d'Uruk*, no. 38, plates 72-75 (Paris, 1922).

[5] At first sight, it appears tempting to make use for the calculation of the measures of capacity of the various stereometrical school texts with their seemingly precise data. However, it must not be forgotten that those texts served the purpose of familiarizing the student with stereometry, on the one hand, and with the qualities of the numbers and their handling in the sexagesimal system, on the other. Therefore the problems were chosen so as to contain, in most cases, numbers divisible by each other without a rest, or square roots of square numbers, cube roots of cube numbers, and the like. Accordingly, the measures of capacity occurring in the operations had to be adapted to the nature of the problem, a procedure which could be used without danger since, as may be stressed again, the purpose of the texts was not to acquaint the student with the measures of capacity the knowledge of which was presupposed.—If I skip the schoolbook which I used as a child when studying the elements of mathematics, I find there the same adaptation of measures to the nature of the problem: for the sake of reckoning with simple relations, the American pound is figured at 460 grammes instead of 453.59; the yard is rounded off to $1\frac{1}{12}$ of a meter instead of being exactly 91.44 centimeters, and so on.

On the other hand, religious books and texts represent,

this specification of the sûtu [6] for the calculation of the qa, it is, of course, necessary to determine according to which standard substance vessels were graduated. In this case, we can without danger use the information furnished by the stereometrical school-texts [7] which take it for granted that a standard vessel was filled with barley.[8] Hence we have to determine the volume of 10 minas, or roughly 5 kilogrammes, of barley in order to calculate the capacity of the sûtu used in the ritual AO 6451. Since the specific weight of barley depends largely upon the variety of *hordeum* involved, it is important to know from the investigation of Frimmel [9] that the barley grains found at Nippur in the storage magazine of a Parthian palace [10] were of the four-row variety and were provided with remnants of awns. Thus we may well conclude that the barley grown in Babylonia was *hordeum vulgare* which, in this country as well as in France, is the variety most commonly cultivated. Since, on the other hand, some passages from Nuzian economic texts [11] suggest that for the manufacture of barley-wine a different variety was used (just as in modern countries the two-row barley is preferred for brewing purposes), we have to reckon with the possibility that also *hordeum distichon* was grown in the ancient Near East. Now the weight of *hordeum vulgare* varies between 58 and 62 kilogrammes per hectoliter,[12] whereas that of *hordeum distichon* is estimated at 65 to 72 kilogrammes per hectoliter. Accordingly we shall not be mistaken in taking 65 kilogrammes per hectoliter as the average weight of Babylonian barley. If we figure the mina at 0.505 kilogrammes, we thus reach the result that the sûtu of ten minas had a capacity of $\frac{100 \times 5.05}{65} = 7.7$ liters. Since in the Neo-Babylonian period (in which, as was mentioned before, the ritual AO 6451 was drawn up in its extant form) the sûtu contained 6 qa,[13] it follows that the qa had a capacity of $\frac{100 \times 5.05}{65 \times 6} = 1.29$ liters.

Corroboration of this result can be obtained in various ways. As was pointed out by Weissbach in his latest exhaustive discussion of the measures occurring in the so-called Esagila tablet,[14] the Neo-Babylonian sûtu and qa belonged to a system of measures of capacity which were to each other in the relation of 1:6:180, the largest measure, named kurru, being divided into either 30 sâtu or

for the problem here under discussion, the most reliable sources available; for no adherent of any religious faith wants to incur the divine wrath by using for a cult ceremony a measure different in size from that prescribed by the ritual.

[6] It will be pointed out below, note 36, that this specification was due to the fact that, besides the sûtu to be used in the ritual, the author of the text knew a homonymous measure of different size.

[7] See, e. g. the problems discussed by Thureau-Dangin on pp. 84 f. of the article quoted above, note 3; see further the problems treated by the same author *RA* 32. 10 f. (1935). (All the problems mentioned were republished in transliteration and translation by Thureau-Dangin, *Textes mathématiques babyloniens* 32 ff. and 41 f. [Leiden, 1938].)

[8] We can, without hesitation, translate *še'um* by 'barley,' for it is a well-known fact that each people designates as 'corn par excellence' the variety of grain which constitutes its staple food; cf., e. g. the use, in this country, of the term 'corn' for maïs, or that of German 'Korn' for rye. (For an isolated case where, in the stereometrical school texts, *še'um* interchanges with *šeṭṭatum* see Thureau-Dangin, *Textes mathématiques babyloniens* 42, note 2.)

Thureau-Dangin, who, as was mentioned above (p. 65), based his calculation on the assumption that the standard sûtu-measure was filled with water (see the references quoted above, note 2), obviously had in mind the method used by the French Academy when, in 1790, on orders of the revolutionary government, they established the metric system of weights and measures. For the ancient Near East, where all theoretic considerations are subordinated to the necessities of daily life, water as a standard can be ruled out; for while occurring hundreds of times as measures of barley and other small grains, neither the sûtu nor the qa is ever mentioned in connection with water.

[9] See *Sitzungsberichte der Kais. Akademie der Wiss. in Wien*, phil.-hist. Klasse, 173. Band, 1. Abh. 188 ff. (Wien, 1913).

[10] See Hilprecht, *Historical Sketch of the Exploration of Assyria and Babylonia in the 19th Century* (Reprint from *Explorations in Bible Lands During the 19th Century*), 568 (Philadelphia, 1903).

[11] See, e. g. Pfeiffer and Lacheman, *Miscellaneous Texts from Nuzi, Harvard Semitic Series*, vol. 13, no. 221, l. 62; no. 234, l. 10 (Cambridge, Mass., 1942; hereafter referred to as H XIII).

[12] See *La Grande Encyclopédie*, s. v. *Orge*. In this country, the weight of *hordeum vulgare* is given as 48 pounds (of 453.59 grammes each) per bushel (of 35.24 liters), i. e. 61.8 kilogrammes per hectoliter; see Boss, Wilson, Petersen and Field, *American Farming, Agriculture* II. 126 (Saint Paul, Min., 1940); Sherwood, Stinson, Richards, *Crop Production Handbook* 184 (Urbana, Ill., 1941).

[13] The fact that at earlier periods the sûtu contained 10 qa will be discussed below, p. 69 with note 36.

[14] See Wetzel and Weissbach, *Wissenschaftliche Veröffentlichung der Deutschen Orient-Gesellschaft* 59. 50 ff. (1938).

180 qa. The same relation recurs in the set of measures attested in the post-biblical Jewish sources, where the largest measure, the kor (כור), contained 30 seah (סאה), while the seah comprised 6 qab (קב). The recurrence of this characteristic relation in the Rabbinic literature suggests that, in the course of one of their various contacts with the Neo-Babylonians, the Israelites adopted the Neo-Babylonian system of measures of capacity, an inference which is well in line with the fact that at least two of the three Hebrew designations are etymologically identical with the corresponding Babylonian names.[15]

Since the Talmud distinguishes, however, between three homonymous sets of measures of capacity known as מדה מדברית 'the desert measure'; מדה ירושלמית 'the Jerusalem measure'; and מדה ציפורית 'the Sepphoris measure,' it remains to determine which of the three sets corresponds to the Neo-Babylonian standards, a task which is facilitated by the fact that the available sources contain precise data in regard to the size of the measures of each system. We mention in the first place a passage from Epiphanius' Treatise on Weights and Measures[16] where it is said that in some places the qab was figured as the fourth part of the modius, in others as the fifth, and in again others as the sixth.[17] As the seah contains six qabs, Epiphanius' definition implies the coexistence of three seah-measures holding respectively 1½, 1⅕, and 1 modii.[18] Jewish sources indirectly confirm Epiphanius' statement in so far as the Babylonian Talmud (Er. 83ᵃ) occasionally uses seah and modius as interchangeable expressions;[19] this terminology obviously has its origin in the region where the smallest of the three measures enumerated by Epiphanius was in use. Josephus,[20] on the other hand, knows a seah which, being equal to 1½ modii, belongs to the largest of the three sets of measures implied by Epiphanius.

The Babylonian Talmud, however, provides us with a means of determining the capacity of the three sets of measures more precisely than by comparing them with Roman standards. In the aforequoted passage from the tractate 'Êrûbîn it is said that the desert seah was equal in size to the volume of 144 eggs. In regard to the two homonymous measures the text continues to point out that the Jerusalem seah exceeds that of the desert by one sixth (scil. of the former), while the Sepphoris measure, in turn, surpasses the Jerusalem seah by the same fraction. Obviously in view of these relations, the author of our passage calculated the volume of the Jerusalem seah at 173 eggs[21] and that of the Sepphoris seah at 207.[22] It will be noted that the proportion here established between the three measures does not differ materially from that given by Epiphanius: whereas the Babylonian

[15] These two are, of course, *kor* and *seah*. As regards *qab* and *qa* (nom. *qû* < *qû'um*; see H. and J. Lewy, *Hebrew Union College Annual* 17. 53, note 232 [1943]), a common origin of the two terms seems not impossible.

[16] See the Greek version published by de Lagarde, *Symmicta* 2. 152 ff. (Göttingen, 1880). For the Syriac version see the recent edition with an English translation by J. E. Dean, *Epiphanius' Treatise on Weights and Measures* (Chicago, 1935).

[17] See de Lagarde, op. cit., 186, 1; cf. Dean, op. cit., fol. 46ᵃ, ll. 4 ff.; fol. 62ᵃ-62ᵇ, ll. 30 ff.

[18] To be sure, Epiphanius mentions the triplicity of the Hebrew measures only in his discussion of the qab but not when treating the seah, which latter he defines as a modius and a quarter (Syriac version, fol. 45ᵈ-46ᵃ; fol. 59ᵈ). However, he implies the existence of the seah equal to 1 modius when he determines the kor as 30 modii (Syriac version, fol. 45ᵈ; fol. 59ᵇ); since, as we have mentioned, the kor contained 30 seah, it follows that the source used here by Epiphanius identified seah and modius.

[19] Modern interpreters such as Zuckermann, *Das jüdische Maass-System* 41 (Breslau, 1867), or Krauss, *Talmudische Archäologie* 2. 395 (Leipzig, 1911), are inclined to reject this Talmudic terminology as 'ungenau' (so Krauss), even though the latter author seems to be well acquainted with the passage from Epiphanius quoted above, note 18, which, as has been seen, uses virtually the same phraseology as the Talmudic source. Moreover, the identification of seah and modius is well in line with a remark in the Mishnâ (Kel. 17, 11) which, after having pointed out that in general metrical indications refer to medium-size measures, continues as follows: 'Sometimes they refer to small measures; in regard to liquids and dry goods the Italian measure is meant, that is the desert measure.' Accordingly here, too, the smallest of the three possible seah-measures is understood to be identical with the Italian measure, i. e., no doubt, the modius. (Zuckermann, op. cit., 8, quotes this Mishnic passage in support of the identification of the Jewish measure log (לוג) with the Roman sextarius. This interpretation must, however, be rejected since, as will be presently seen [below, note 25], the identification of log and sextarius applies only to the largest of the three sets of Jewish measures, whereas our passage expressly speaks of the smallest.)

[20] See *Ant.* 9, 4, 5.

[21] If the number of eggs comprised in the Jerusalem seah is designated by x, he figured $x - x/6 = 144$, rounding off the resulting $x = 172\frac{4}{5}$ to 173 eggs.

[22] If the number of eggs contained in the Sepphoris seah is designated by y, we have $y - y/6 = 172\frac{4}{5}$; $y = 207\frac{2}{25}$, rounded off to 207.

Talmud fixes it at 25:30:36, Epiphanius' statement implies a relation of 24:28.8:36.

As regards the capacity of those measures expressed in modern terms, I measured the displacement of two dozen of medium-sized hen-eggs,[23] i. e. the equivalent of one desert qab,[24] and found that it amounts to 1.35 liters.[25] Accordingly, the desert seah comprised 6×1.35, or 8.10, liters, a result which agrees well with the occasional identification of desert seah and modius,[26] the latter measure having been determined by Viedebantt at approximately 8½ liters.[27]

Fortunately we are in a position to verify the result of our empiric determination of the egg-size and the other post-biblical measures of capacity without relying on the Roman metrological system. In the tractate Pesâḥîm (109a), the Babylonian Talmud quotes the following statement by Rabbi Ḥisda: 'The quarter(log) of the Tôrâ measures 2 by 2 fingers and has a height of two and a half plus one fifth fingers.' The qab containing 4 logs (or 16 quarter-logs), this determination of the quarter-log implies that the qab was equal in volume to $16 \times 2 \times 2 \times 2\frac{7}{10}$, or $172\frac{4}{5}$, cubic fingers. Since Rabbi Ḥisda attributes this particular definition to the Tôrâ, it seems ipso facto likely that it refers, among the three homonymous sets of measures, to that used in Jerusalem.[28] Now we have seen before [29] that the Jerusalem seah was equal in volume to $172\frac{4}{5}$ eggs, i. e. the Jerusalem seah contained exactly as many eggs as the Jerusalem qab contained cubic fingers. In other words, the cubic finger and the egg are to each other in the same relation as the qab and the seah. This latter relation being (as has been mentioned repeatedly) one to six, we obtain the equation

$$1 \text{ egg} = 6 \text{ cubic fingers.}$$

If our empiric determination of the egg as 56.2 cubic centimeters [30] is correct, it should, when applied to this equation, furnish one of the well-known values of the smallest measure of length of the ancient Oriental metrological system, the finger. This is actually the case; for our egg value leads to a finger of 2.11 centimeters,[31] or, since the Neo-

[23] That the eggs for measuring purposes should be medium-sized is stated in the Mishnâ, where it is said (Kel. 17, 6) that they should be 'neither big nor small but of middle size.' Those persons who were in doubt about the proper 'middle size' are adviced in the same passage to select among their eggs the largest and the smallest, to put them in water, and to divide by two the volume of water displaced.

[24] Since, according to the afore-quoted passage B. Er. 83a, the desert seah was equal in volume to 144 eggs, the desert qab, sixth part of the seah, corresponded, of course, to 24 eggs.

[25] Accordingly, the volume of an average egg is 56.2 cubic centimeters. Zuckermann, who, op. cit., 37, determined the size of an egg by calculation, came to the conclusion that it amounts to 4.616 Parisian cubic inches, i. e. approximately 91 cubic centimeters, a value which, even though abnormal, was accepted ever since by uncritical writers and, even today, is to be found in encyclopaedias and handbooks (see, e. g. *The Jewish Encyclopaedia*, s. v. *Weights and Measures*). The very nature of his result forced Zuckermann to reject altogether the method of determining the capacity of the Jewish measures by ascertaining, in accordance with the Mishnâ, the volume of water displaced by the respective number of eggs (see op. cit., 4). However, his calculation contains a very obvious error which accounts for the enormous size of the egg presupposed by him. He based his determination of all the Jewish measures of capacity on the equality, implied by a Talmudic passage (B. Pes. 109a), of the Jewish measure log and the Roman sextarius. Since the log is the fourth part of the qab and hence the 24th part of the seah, while the Roman sextarius is the 16th part of the modius, this equation furnishes a seah equal to 24 sextarii, or 1½ modii; in other words, it applies to the largest of the three homonymous measures deduced by us from the statement of Epiphanius quoted above, p. 67. As we have further seen that this largest measure was called Sepphoris measure, it becomes clear that the equation 1 log = 1 sextarius applies only to the Sepphoris set of measures. In fact, the passage B. Pes. 109a used by Zuckermann expressly states that the log which was equal to the Roman measure was in use in the town of Sepphoris, a remark which obviously was overlooked by Zuckermann when he computed the egg volume. For when he reckoned (op. cit., 36)

$$1 \text{ sextarius} = 1 \text{ log} = \tfrac{1}{24} \text{ seah} = 144\tfrac{1}{24} \text{ eggs,}$$

he used the number of eggs contained in the desert seah (see the passage from the tractate B. Er. quoted above, p. 67). Had he, in accordance with the Talmud, calculated

$$1 \text{ sextarius} = 1 \text{ Sepphoris log} = \tfrac{1}{24} \text{ Sepphoris seah} = 207\tfrac{1}{24} \text{ eggs,}$$

his result would have been nearly correct.

[26] For this identification see above, p. 67 with note 18.

[27] See his study *Forschungen zur Metrologie des Altertums, Abh. der Sächs. Gesellsch. d. Wiss.*, phil.-hist. Kl. 34, fasc. 3 (Leipzig, 1917).

[28] If this conclusion is correct, i. e. if the measure defined by Rabbi Ḥisda is the 16th part of the Jerusalem qab, the two homonymous measures would, according to the proportion between the three sets given above p. 67, comprise 144 cubic fingers (desert qab) and $207\frac{2}{25}$ cubic fingers (Sepphoris qab), respectively.

[29] See above, p. 67 with note 21.

[30] See above, p. 68a with note 25.

[31] If x designates the number of centimeters contained in a finger, our relation between egg and cubic finger furnishes the following equation:

$$56.2 \text{ cubic centimeters} = 6\,x^3$$

$$x = \sqrt[3]{\frac{56.2}{6}}$$

$$x = 2.11 \text{ centimeters}$$

Babylonian finger was the 24th part of the cubit,[32] a cubit of ca. 50.64 centimeters. This actually being almost exactly the length of the Neo-Babylonian cubit as obtained from the dimensions of the platform of the temple-tower of Babylon,[33] our calculation not only justifies the empiric method of determining the egg-size as measure of capacity, but it furnishes the additional result that the measures of length used in the Talmudic period were the well-known Neo-Babylonian standards.

Having assured the correct capacity of the Talmudic desert qab of 24 eggs as 1.35 liters,[34] we are now in a position to state that not only the post-biblical Jewish measures of length but also those of capacity were identical with the corresponding Neo-Babylonian standards; for since our value of the desert qab differs from that of the Neo-Babylonian qa calculated previously [35] by less than 5 per cent, it is obvious that both represent the same measure and that, accordingly, the Babylonian system of qa, sûtu, and kurru survived in the Hebrew qab, seah, and kor.

In view of the fact that the Talmud contains, as we have seen, far more detailed definitions in regard to the qab than do the Babylonian sources concerning the qa, it seems ipso facto likely that the value of 1.35 liters based on the Talmudic information represents a closer approximation than does the value of 1.29 liters which contains as a somewhat uncertain factor the specific weight of the variety of barley grown in Babylonia. Therefore it is of particular importance to have a third way of determining, independently of our previous calculations, the capacity of the measure here under discussion. Both the sûtu and the qa recur as measures of grain in the Middle Assyrian sources as well as in the texts from Nuzi. There, however, they are part of a decimal system, the largest unit of which, called imêru, or 'ass measure,' was divided into 10 sâtu, each sûtu comprising 10 qa.[36] The measuring of small grain in terms of ass-units is easily conceivable if it is remembered that even today in some Arab villages having but one common threshing floor it is the ass that carries the farmer's crop to that place and thence, after the threshing, to his storage magazine. Since, as we pointed out before, barley was the staple product of ancient Oriental agriculture, we shall therefore not fail in defining the largest measure of the Middle Assyrian system as the volume of barley which could be conveniently loaded upon an ass.[37] The carrying capacity of an average Mesopotamian donkey expressed in modern weight amounting to about 90 kilogrammes,[38] an Assyrian ass-unit of barley contained, according to

[32] That the Neo-Babylonian cubit contained 24 fingers, and not 30 as did the older homonymous measures, was first pointed out by Thureau-Dangin, *Journal Asiatique* 13. 82-85 (1909).

[33] See Weissbach, op. cit., 51; the cubit thus determined has a length of 50.8 centimeters.

[34] If the desert qab contains 1.35 liters, the Jerusalem and Sepphoris qabs which, according to the relation established above, p. 67, had a volume $6\frac{2}{5}$ and $36\frac{2}{25}$ times as large as the desert qab, comprised 1.62 liters and 1.944 liters, respectively. The three corresponding seah-measures then held 8.10 liters, 9.72 liters, and 11.664 liters, respectively. Accordingly, the largest of the Talmudic seah-measures was slightly smaller than the modern Palestinian seah which Dalman, *Zeitschrift des Deutschen Palästina-Vereins* 28. 36 (1905), determined at 12.50 liters.

[35] See above, p. 66.

[36] The ancient origin of the decimal relation between those two measures of capacity is proved by the fact that in the Old Babylonian period the sûtu also comprised 10qa and not 6 as it subsequently did. The author of the ritual text AO 6451 (quoted above, p. 65 with note 4) obviously thought of this larger sûtu when he found it necessary to specify the measure to be used in the relevant ceremony as the sûtu weighing 10 minas. The existence of still another sûtu is revealed in the Nuzi text H IX 66 which distinguishes between the sûtu of 10 qa (so l. 2) and that of 8 qa (so ll. 4; 8; 10; cf. H XIII 292, ll. 16 f.; H XIII 294, l. 2: *i-na 10 qa sûti*). For the occurrence of a sûtu containing 12 qa see King, *Babylonian Boundary-Stones and Memorial-Tablets in the British Museum*, no. VII, col. I, l. 21 (London, 1912), l. 45[b] of the Esagila tablet (so against Weissbach, op. cit., p. 56), and Thureau-Dangin, *Textes mathématiques babyloniens* 41, note 4. All those passages make it clear that, serving as a definition for the various sûtu-measures, the qa was unequivocal and, accordingly, stable, a fact for which we shall presently submit further evidence.

[37] The Oriental habit—somewhat unfamiliar to us—of determining the carrying capacity of a beast of burden by the volume and not by the weight is elucidated by a passage in the Mishnâ (B. M. 6, 5; for the Talmudic interpretations of this passage see Levy, *Neuhebräisches und Chaldäisches Wörterbuch* vol. 3. 418 f. s. v. נפח and נפחא [Leipzig, 1883]) according to which a person who rented an ass for the purpose of transporting a certain weight of wheat and, instead, charged the beast with the same weight of straw or some other matter specifically lighter than wheat, was subject to the payment of an indemnity corresponding to the surplus volume, 'because,' as the text states, 'it is the volume that makes the burden hard (to carry).'

[38] See *Kurze militärgeographische Beschreibung von Mesopotamien*[2], *Kartographische Abteilung der kgl. Preussischen Landesaufnahme* 62 (Berlin, 1917).

the ratio established above (p. 66), $\frac{90 \times 100}{65}$, or 138, liters. Hence the qa, the hundredth part of the imêru, comprised approximately 1.38 liters. This value of the Assyrian and Nuzian qa agrees well enough with the results of our two previous calculations (viz. 1.29 liters for the Neo-Babylonian qa and 1.35 liters for the Talmudic desert qab) to allow the conclusion that the Neo-Babylonian qa weighing 10 minas, the Hebrew desert qab equal in volume to 24 eggs, or 144 cubic fingers, and the Assyrian and Nuzian qa representing the hundredth part of an ass-unit are all basically the same measure.[39]

An investigation into the rates of seeding attested in the various groups of sources not only amplifies the results so far obtained in regard to the use, between the 15th century B. C. and the early Middle Ages, of the qa of approximately 1.34 liters,[40] but makes it possible to trace that measure as far back as the Neo-Sumerian period. Even though the rate of seeding varies, of course, with the climatic conditions as well as with the different kinds of soil, our sources contain some indications as to the rates considered normal during the Neo-Sumerian, the Kassite, the Nuzian, the Neo-Babylonian, and the Talmudic periods. To begin with the Neo-Babylonian rate, the Esagila tablet (ll. 17 f.) implies that 3 PI, or 108 qa, of grain were taken to be the average amount of seed for a field measuring 3 by 3 ṣubban in small cubits, i. e. 180×180 cubits.[41] If, in accordance with our previous results, we figure the qa at 1.34 liters and the cubit at 0.5 meters, we obtain the rate of 108×1.34 liters for 8100 square meters, or 100 liters per 5597 square meters. A comparison of this proportion with the rate of barley seeding in various modern countries makes it clear that the qa of 1.34 liters actually formed the basis of agronomic computations during the Neo-Babylonian period: in this country, the farmer figures 2 bushels of barley per acre of land,[42] which means, in terms of the metric system, 100 liters for 5742 square meters.[43] In France, 200 liters per hectare, or 100 liters for 5000 square meters, is considered the average rate.[44] As regards modern Palestine, Dalman [45] remarks that 1 seah of grain is used for the seeding of 1 feddân, or 734 square meters, of land. Since, as was noted above (note 34), the modern Palestinian seah contains, according to Dalman, about 12.5 liters, the rate of seeding among the Palestinian Arabs amounts to 100 liters per 5872 square meters. Hence it follows that, by figuring the qa at 1.34 liters, we obtain, for the Neo-Babylonian period, the same proportion between the amount of seed-corn and the seeded surface which is considered normal in modern agriculture.

A different rate occurs in the kudurrus from the Kassite period [46] where the usual amount of seed was 30 qa of barley for 1 iku of land measured by the large cubit, which means 30 qa for 8100 square meters.[47] If we again figure the qa at 1.34 liters, these data furnish a rate of 100 liters per 20149 square meters; in other words, in the Kassite period a surface more than three times as large as in later times was seeded with the same amount of grain. In view of the fact that, as we have seen, the rate of seeding was almost constant from the Neo-Babylonian period to the present time, so considerable a difference is, at first sight, rather surprising. However, a Sumerian text,

[39] In view of this result it is interesting to compare the information contained in Hebrew sources in regard to the carrying capacity of an ass with the Assyrian data. In the passage from the Mishnâ quoted above, note 37, it is implied that an ass should not carry more than one letek (לתך), a unit which is equal to half a kor (so according to Epiphanius, op. cit., fol. 45[d] and 59[b]; for Talmudic references see Zuckermann, op. cit., 45), or 90 qabs. In other words, the average bulk loaded upon an ass in the Talmudic period differed from that considered adequate more than two thousand years earlier by only ten per cent.

[40] The value 1.34 liters is found by taking the average of the three results calculated previously.

[41] For the measures PI and ṣubban and their relation to other measures see the study by Weissbach quoted above, note 14.

[42] See pp. 151 and 258 of the *Crop Production Handbook* quoted above, note 12; see further p. 129 of the work by Boss, Wilson, etc. quoted in the same footnote.

[43] As was mentioned above, note 12, the bushel corresponds to 35.24 liters, whereas the acre comprises 4047 square meters.

[44] See *La Grande Encyclopédie*, s. v. *Orge*.

[45] See *Arbeit und Sitte in Palästina*, vol. 2. 181 f. and 201 (Gütersloh, 1932).

[46] See, e. g. no. II, face B, l. 1; no. IV, col. I, l. 1; no. V, col. I, l. 2 of the work by King quoted above, note 36; cf. also ll. 22 ff. (and 45[b]) of the Esagila tablet and Gadd and Legrain, *Ur Excavations, Texts*, I, p. 50, sub no. 165 (London, 1928).

[47] In order to transform the 'iku measured by the large cubit' into metric measures, it has to be remembered that, as was pointed out by Weissbach in the study quoted above, note 14, the iku was a square with a side-length of 120 cubits, while the large cubit was equal to 1½ small cubits, or 0.75 meters. Accordingly, one iku covered a surface of $120^2 \times 0.75^2$, or 8100, square meters.

which reveals the standards used in the late third millennium B. C., explains the divergence between the two rates. This text, the pertinent passages of which were quoted by Landsberger,[48] implies that a square field the sides of which measured one NINDA should contain eight furrows, and that for each NINDA of furrow $\frac{1}{60}$ qa of seed-barley should be used.[49] In other words, each of the eight furrows within the square NINDA received $\frac{1}{60}$ qa of barley, so that the square NINDA as a whole was sown with $\frac{8}{60}$ qa. Since the NINDA is equal to 12 cubits,[50] or 6 meters, these data reveal a rate of $\frac{8}{60}$ qa for 36 square meters, or 30 qa for 8100 square meters, which means, a rate identical with that of the kudurrus from the Kassite period.[51] The statement of our text that the row spacing should amount to $\frac{1}{8}$ NINDA, or 0.75 meters, makes it clear why this older rate of seeding was so much lighter than that used in Neo-Babylonian and modern agriculture: today the row spacing of a field sown with barley is approximately 0.20 meters,[52] i. e. it is less than one third of that revealed by the Sumerian text. In fact, the older row spacing of 0.75 meters is to the modern one in almost exactly the same relation as the older rate of seeding is to that of Neo-Babylonian and modern farming;[53] in other words, the lightness of the Kassite and Neo-Sumerian rate of seeding was due only to the abnormally large row spacing,[54] whereas the average distance between the seed-corns within the furrow was approximately the same in all the periods under consideration.[55] This result fully justifies our assumption[56] that the basic unit referred to in the aforementioned Kassite and Neo-Sumerian passages was the qa of 1.34 liters which we previously determined from later sources.

[48] See *Die Serie ana ittišu* 154 (Roma, 1937).

[49] Cf. also p. 36 with notes 2 and 3 of the work by Thureau-Dangin quoted above, note 36.

[50] See Thureau-Dangin, op. cit., p. xiii.

[51] Landsberger, op. cit., 154 f. and 254 f., failed to recognize this identity because he relied on the now antiquated discussion of the rate of seeding by Schwenzner, *MVAG* 19, fasc. 3. 54 ff. (1914).

[52] See *La Grande Encyclopédie*, s. v. *Orge*; in this country, the average row spacing for small grain sowing is 8 inches, or 0.2032 meters.

[53] If we designate by x the surface seeded in the Kassite and Neo-Sumerian periods with 100 liters of barley and take an average of 5500 square meters for the corresponding Neo-Babylonian and modern surface, while 75 and 20 centimeters are the respective row spacings, we have the equation:

$$x : 5500 = 75 : 20;$$

the resulting value $x = 20625$ square meters comes close enough to the Kassite and Neo-Sumerian rate of 29149 (see above, p. 70) to justify our conclusion.

[54] Since even so reputed a savant as Benno Landsberger flatly declares (op. cit., 154) that a row spacing of 75 centimeters is definitely "zu gross," it seems necessary to enter into a brief discussion of the question as to why from the Neo-Sumerian period down to the time attested by the Kassite and Nuzian texts the average row spacing was so much larger than today. The answer to this question is provided by two passages in the Mishnâ where a custom similar to that of those ancient days is clearly discernible. Kil. 2, 6 it is mentioned that a field was divided into narrow strips, or beds, in such a way that a fallow strip of land alternated with a cultivated one. One of the reasons for this arrangement is implied in the story in 4, 9b of the same Mishnic tractate where it is said that in one year a certain strip was seeded and the neighboring strip left fallow, whereas in the following year the previously fallow land was tilled while the soil of the other was given a chance to rest. In other words, instead of leaving an entire field fallow for one season, the farmers of the ancient Near East prevented the exhaustion of their soil by dividing their fields into one-furrow beds which were alternately tilled and left fallow. In the Neo-Babylonian period, in which the rate of seeding implies a row spacing equal to today's average, this method of avoiding a decline in the fertility of the soil obviously was abandoned in favor of a more economic practice, perhaps that mentioned in B. B. M. 107a where it is recommended to sow a field lengthwise in one year and crosswise in the next.

[55] As regards the rate of seeding customary in the Arrapakhitis in the middle of the second millennium B. C., the Nuzi text H XIII 267 implies that a field the surface of which measured 5 imêru was seeded with 4 imêru of barley. If the imêru of barley is calculated at 100 qa, or 134 liters, and the imêru of surface at 18000 square meters (for this value see our article *La mesure de l'imêru dans les textes de Nuzi*, *RA* 35. 33 ff. [1938]), these data furnish a rate of 100 liters per 16791 square meters; hence the Nuzian rate was about 16 per cent heavier than that of the Neo-Sumerians and Kassites.

The statement of H XIII 267 that a field of 5 imêru of surface was seeded with 4 imêru of barley seems at first sight rather surprising; for to judge from the terminology of modern 'Irâq where a ğarîb of land designates the surface sown with a ğarîb of wheat (cf. also the Hebrew expressions בית כור, בית סאה, etc., denoting the amount of land sown with 1 kor, or 1 seah, of grain), one should expect that an imêru of land be seeded with 1 imêru of barley. The seeming difficulty disappears, however, if it is remembered that the Nuzians distinguished, as was mentioned above, note 36, between a sûtu of 10 and another one of 8 qa, and, accordingly, also between an imêru of 100 and one of 80 qa. Hence the rate of 4 imêru of barley per 5 imêru of land obviously presupposes the imêru of 100 qa, whereas the theoretic rate of 5 imêru of grain for 5 imêru of land would apply to the smaller imêru of 80 qa.

[56] See above, p. 70.

Having recognized that the qa of 1.34 liters was in continuous use in Babylonian agriculture from the late third millennium B. C. down tc the Neo-Babylonian period, the question remains to be answered as to whether this measure, which, as we have shown, was well known to the Israelite savants of the early post-Christian era, still represented, at that time, the basic unit of agronomic computations. The very fact that, as was pointed out above, the Babylonian measures are known in the Talmud as 'desert seah' and 'desert qab' indicates that this was not the case. For by attributing their use to one of the earliest periods of Israelite history, namely the sojourn in the desert after the Exodus from Egypt,[57] the Talmud seems to assign to these measures more historical than practical significance. The information contained in our sources in regard to the rates of seeding confirms this conclusion. In B. Er. 23[b] it is implied that 2 bêṯ seah, i. e. the surface seeded with 2 seah of grain, represented a rectangle of 100 by 50 cubits. In other words, one seah of grain seeded a surface of 2500 square cubits, or 625 square meters. This relation between the seed-corn and the seeded surface leads, in fact, to the 'normal' rate of seeding[58] if we assume that the seah here used was the largest of the three homonymous measures, i. e. the Sepphoris seah of ca. 11.6 liters;[59] for then our passage furnishes a rate of 100 liters per 5390 square meters. A similar result is provided by a statement in the Tosephta[60] where a bêṯ roḇaʿ, i. e. the surface seeded with one fourth of a qab,[61] is said to cover a square of about[62] 10.5 by 10.5 cubits. Again on the assumption that the qab here meant was the large Sepphoris measure of ca. 1.9 liters, we obtain from these data a rate of seeding of 100 liters per 5800 square meters, i. e. virtually the 'normal' rate. Hence it becomes clear that the desert measures of the post-biblical Israelite sources, identical with the millennia old Assyro-Babylonian standards, had given way, in agricultural life, to the larger Sepphoris measures[62a] which, as we mentioned before,[63] differ but slightly from those used even today by the natives of Palestine.

For the reader's convenience we add a tabulation of the measures of capacity and rates of seeding discussed in the preceding pages.

A. MEASURES OF CAPACITY.

1. Middle Assyrian and Nuzian Measures:
   1 qa = 1.34 liters
   1 sûtu = 10 qa = 13.4 liters
   1 imêru = 10 sâtu = 100 qa = 134 liters
2. Neo-Babylonian Measures:
   1 qa = 1.34 liters
   1 sûtu = 6 qa = 8.04 liters
   1 kurru = 30 sâtu = 180 qa = 241.2 liters
3. Hebrew Desert Measures:[64]
   1 cubic finger = 9⅓ cubic centimeters
   1 egg = 6 cubic fingers = 56 cubic centimeters
   1 qab = 24 eggs = 144 cubic fingers = 1.34 liters
   1 seah = 6 qabs = 144 eggs = 8.04 liters
   1 kor = 30 seah = 180 qabs = 241.2 liters

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[57] Cf. Rashi's commentary to the passage from B. Er. 83[a] quoted above, p. 67.

[58] See the rates mentioned above, p. 70; further note 53 and passim.

[59] See above, note 34.

[60] See Kil. 2, 6.

[61] See the version of our passage quoted by Lieberman, *Tosefeth Rishonim*, part 1. 89 (Jerusalem, 1936). Dr. Alexander Guttmann was kind enough to call my attention to this fuller variant which expressly speaks of בית רובע הקב.

[62] See the variant quoted by Lieberman, loc. cit.

[62a] This conclusion is confirmed by a statement in al-Muqaddasi's well-known geographical work to the effect that the inhabitants of Jerusalem were accustomed to make use of the modius as well as of the qab "which equals a quarter of the modius" (in Guy Le Strange's partial translation *Description of Syria, including Palestine*, London, 1886, the relevant passage of the chapter on the 'Measures of Capacity' is found on p. 73). This remark implies that in the tenth post-Christian century the Jerusalemites actually used the largest of the three homonymous qab measures discussed above, p. 67.

[63] See above, note 34.

[64] For the relation of the desert measures to the Jerusalem and Sepphoris measures see above, p. 67 and note 34.

B. RATES OF BARLEY SEEDING:

	Rates in local measures	Number of square meters seeded with 100 liters	Row spacing in meters
modern American	2 bushels per acre	5742	0.20
modern French	200 liters per hectare	5000	0.20
modern Palestinian	1 seah per feddân	5872	
Jewish (Tosephta)	¼ qab for 10.5 × 10.5 cubits	5800	
Jewish (Talmud)	2 seah for 100 × 50 cubits	5390	
Neo-Babylonian	108 qa for 180 × 180 cubits	5597	
Kassite	30 qa for 1 iku	20149	0.75
Neo-Sumerian	⅝₀ qa per square NINDA	20149	0.75
Nuzian	4 imêru for 5 imêru of land	16791	

BABYLONIAN, ASSYRIAN AND PERSIAN MEASURES

ANGELO SEGRÈ

THE FUNDAMENTAL measures of weight of the Babylonian and Assyrian metrology are well known. The Babylonian talent weighed kg. 30.13 and was divided in 60 minae each of gr. 502. The mina was equal to 60 sicles of gr. 8.37. A silver sicle of gr. 5.58 was used as a coin under the Persian domination when silver was fixed at a ratio of 1 : 13⅓ with gold. But, even then, in the Babylonian texts sicles weighed gr. 8.37. In the Seleucidian period the Attic standard was used for the coinage and the heavy sicle was equal to the Attic tetradrachmon of gr. 17.47, while the old monetary unit, the silver sicle of gr. 8.37 was replaced very probably by a didrachmon of gr. 8.73.[1]

The Babylonian talent of kg. 30.13 was used from the earliest dynasties of Babylonia and under the Seleucidian rule. We know very little about the changes in the Babylonian and Assyrian metrology after the Greek conquest. Some of these changes may be supposed from the evidence of the Syrian and Palestinian metrology in the Hellenistic age.[2]

The mutual relations between the Babylonian and the Assyrian measures often are well known but we do not know much about the mutual relations between the measures of length, the measures of capacity and the measures of weight. In this note we fix the absolute value of the Assyrian and of the Babylonian measures on the basis of the connections of the measures of capacity with the measures of length and the measures of weight.

The measures of capacity used since the earliest Babylonian dynasties until the Seleucidian age are the following:[3]

Sumerian	Akkadian	
sìla	qû (qa)	216 cubic fingers
bán	sûtu	10 qa
bariga	maššiqu	60 qa
gur	kurrû (kur)	300 qa

[1] For the fractions of the mina see Thureau-Dangin, J. A. XXXI, 1909, pp. 137-38; Weissbach ZMG 65 1911, pp. 625 ff.; Metrologia, p. 97.

A talent for weighing wool corresponded to 1 talent, 6 minae and 4 sicles, i. e., to 66⅘ minae of the talent of kg. 30.13. This talent of kg. 33.17 (Metrologia, p. 99) was used since the dynasty of Ur. Its mina was a weight of kg. 0.553. (Nies Ur Dyn. Tabl. n. 43 Metrologia, p. 98.) According to a Summerian text (Wengler in Deimel Orientalia, 5 p. 48, Metrologia, p. 99) there was also a talent of 61⅔ minae kg. 31.08. A mina, mana-sig-ba, used for measuring woollen dresses has been found as a stone-weight of gr. 680.485 with the name of the High Priest Du-du contemporary of Entemena (Langdon, JRAS 1921, p. 575, Metrologia, p. 98) points to a talent of kg. 40.828. For other weights and possibly other standards see Metrologia, p. 99.

Under the Seleucids the monetary mina was gr. 524 equal to 120 Attic drachmae (see n. 2). The drachmae was divided into 6 obolos probably basik later called in the Persian text of the Byzantine age dang, Greek δανάκη. See Metrologia, p. 103.

[2] For Syria and Palestine, see Syrian and Palestinian Measures, Journ. of Bibl. Literature, LXIV, 1945.

[3] F. Thureau-Dangin, Textes mathématiques babyloniens Leiden, 1938, p. xiv.

In the same period the measures of length used are here indicated:[4]

Sumerian	Akkadian		
šu-si	ubânu	finger	1/30 cubit
kùš	ammatu	cubit	30 fingers
gi	qanû	rod	6 cubits
NINDA[5]	.....	.....	12 cubits
zir	ašlu	rope	10 NINDA
giš	.....	double stadion	60 NINDA
		the way made in a Babylonian hour = 2 hours	1800 NINDA
danna	bêru		

On these measures of length are based the measures of land:

Sumerian	Akkadian	
SAR	.....	1 NINDA square
ubu	ubû	½ ikû
iku	ikû	100 SAR
ese	eblu	6 ikû
bur	burrû (bur)	18 ikû

The measures of length may be collected in the following table:

Measures of length:

danna	m. 1082.16	1					
giš	m. 360.72	30	1				
zir	m. 60.12	180	6	1			
NINDA	m. 6.012	1800	60	10	1		
gi = qanû	m. 3.06	13600	120	20	2	1	
kùš	m. 501	21600	720	120	12	6	1

These data are sufficient to fix the value of the qa, the units of capacity for liquids as well as for dries. In our opinion the capacity of the qa corresponded to the double mina i. e., to liters 1.004. We shall try now to show that this is the correct value of the qa.

We have shown[6] that the burden carried by an ass in Egypt as well as in the whole Roman Empire according to the edict of Diocletian, was 200 Roman pounds. In Egypt 3 artabae of wheat (liters 87.33) with a specific weight of 0.75 weighed 200 pounds. Starting from a biblical bath of liters 20.92, we have stated that a Jewish gomor was a measure of liters 104.9. The *imēru* of 100 qa of the Assyrians is expected to be a measure very near to 100 liters.

Thureau-Dangin correctly gives for the silà = qa the fundamental relation 1 qa = (6 fingers).[8] This equivalence based on YBC 4669 nn. 1 to 9 (see Neugebauer MKT III, p. 54) is verified in many cases. (See Révue d'Assyrologie XXXIV, p. 80 ff.)

6 fingers are 1/5 of a cubit of 30 fingers, therefore a cubit cube of 30 fingers is equal to 125 qa.

The length of the Babylonian cubit was certainly very near to mm. 500. 16 fingers of the cubit of Gudea correspond to 270 mm. according to Deimel, to 265 mm. according to Thureau-Dangin.[7] The cubit of 30 fingers is a measure between mm. 508 and mm. 496: its cube therefore, is a measure between liters 1.05 and liters 0.975.

We think that we may fix the qa as the equivalent of 2 minae or to 1/30 talent. All the ancient measures of capacity corresponded to a talent and were divided in units of capacity which were minae or very simple multiples or fractions of minae. The Attic-Roman amphora was a talent. The Attic choenix of liters 1.08, a measure very near to the qa, was equal to 2 sextarii which were called also heminae. The Egyptian artaba of 40 choenices was a talent whose mina was the hin or Alexandrian sextarius of liters 0.485, the Egyptian choenix

[4] Thureau-Dangin, ibid., p. xiii.

[5] NINDA meant also a measure of time, 1/60 of degree time. giš is equal to the way walked in a degree time, danna berû the way walked in 30 degree time, i. e., in 2 Babylonian hours, i. e., in 1/12 of the day of 360 degrees time.

[6] See Byzantion XVI, On the metrological meaning of "donkey."

[7] Metrologia, p. 114 f.

introduced by the Greeks was a measure corresponding to 1½ hin. The artaba of 48 choenices was at the same time a centenarion equal to a talent whose mina was gr. 582. The bath or ephah the Jewish artaba, was a talent of a light mina of gr. 436 if we reckon this light talent to 50 minae.[8]

Thureau-Dangin correctly supposed the qa to be a measure very near to a liter, but he did not go farther. In R. A. XXXIV 1937, p. 86, he concluded:

Quoi qu'il en soit, on peut tenir pour certain, qu'au temps de la première dynastie babylonienne, le qa normal mésurait 216 doigts cubes. Si on évalue la longeur de la coudée a 0.495 m. (voir R. A. XVIII, p. 127 s) le doigt = 0.0165 m. et 216 doigts cube = 0, 000970299. On peut donc évaluer le qa normal a 0 litre 97. Il est possible que ce qa ait été en usage au temps néo-babylonien. En effet, il resulte d'un fragment d'alabastrum trouvé a Suse, que le qa mésurait sous le règne d'Evil-Merodach, plus de 0'81 (voir R. A. IX, p. 24 f.). En revanche le vas d'argent d'Entemena suppose pour la haute époque sumerienne, une norme tout a fait differente (voir R. A. XXIX, p. 189). Ce qu'il est difficile a expliquer, c'est que le problème VI de BM 85196 (texte qui parait être du même temps et de la même provenance que BM 85194) implique, semble-t-il, un qa de 75 doigts cube (voir R. A. XXXII, p. 11). Faut-il admettre la coexistence de deux qa dont l'un serait le $\frac{1}{125}$ et l'autre le $\frac{1}{360}$ de la coudée cube? It reste aussi a expliquer le "sûtu de 10 mines" mentionné dans un rituel du temps des Séleucides voir R. A. XVIII, p. 131.

Our conclusion that a qa of 216 cubic fingers corresponded to liters 1.004 implies that the *ammatu* of 30 fingers, the royal cubit, was a measure of mm. 501.

The many cases where Thureau-Dangin supposed that the qa was a different measure than the standard qa of liters 1.004 do not show the existence of different qa. The metrological solutions of Thureau-Dangin are not correct. The problems are resolved supposing different measures of length, not different measures of capacity.

In the particular case of a qa equal to $\frac{1}{75}$ cubit cube, the qa was $\frac{1}{25}$ of a small cubit of mm. 429 equal to $\frac{6}{7}$ of the cubit of mm. 501.[9] The sûtu of ten minae mentioned in the ritual of the Seleucidian age by Thureau-Dangin R. A. XVIII, p. 131 points to a *sûtu* of 5 qa: the gur-lugal of 300 qa was measured also with a *sûtu* of 6, with a *sûtu* of 5 qa and with a great *sûtu* of 10 qa.[10]

The gur of 300 qa (10) the Assyrian *imēru* (11) and the gur of 180 qa were measured with a qa of 2 minae.

The cubit of 30 fingers, the royal cubit also called large cubit and also *πῆχυς ἡλίου* in a Greek source, was a measure of mm. 501. Its value is certain because its cube was equal to the side of a cube of liters 125.33 = 250 minae.[11] According to a Greek source the *πῆχυς ἡλίου*[12] very probably had the following divisions:

πῆχυς ἡλίου	mm. 501	1				
παλαιστή	" 66.8	7½	1			
δάκτυλος	" 16.7	30	4	1		
κριθή	" 2.8	180	24	6	1	
θρίξ	" 0.45	1080	144	36	6	1

Herodotus 1 78[13] says that the royal cubit is 3 fingers longer than the *μέτριος* cubit. As we may show more completely later, this cubit was a measure of 429.9 mm.[14] and was divided into 24 fingers.

So far as we know there was neither in Babylonia nor in Assyria a royal cubit of mm. 525 which seems to have a standard measure in the lands previously under the Persian domination, Egypt however, excepted.[15]

The *πῆχυς ἡλίου* is the measure of mm. 501 which in the Babylonian and Assyrian text is called *ammatu rabîtu*, large cubit, the cubit of 24 fingers. mm. 429.4 is the *μέτριος πῆχυς* of Herodotus called in the texts *ammatu ṣiḫirtu*— the small cubit. In our calculations we call the large cubit simply cubit and the small cubit small cubit. According to L. Oppenheim *π. ἡ.* goes back to a *ammatu ša dŠamaš* i. e., "cubit (according to the standard measure of (the) Shamash (temple)" in a parallel to *sûtu dŠamaš* etc.

We think that we may assume safely that the

[8] See JBL LXIV, 1945, § 1.

[9] See p. 78.

[10] Metrol. p. 113.

[11] The side of 180 large cubits of the great square tower of the temple of Bêl in Babylon (Metrologia, p. 118) if these indications are correct, corresponded to m. 90.18. Herodotus 1. 181, however, says that the tower had a stadium as side. The Attic stadium was mm. 177.6 (Metrologia, p. 140) i. e., nearly the double of the measure found by the archaeologists.

[12] Eitrem Aegyptus XIII, 1933, p. 479 ff. A. Segrè, Symbolae Osloenses, XIII, 1934, pp. 68 ff.

[13] Metrologia, p. 118.

[14] Metrologia, p. 118. For its calculation see p. 78.

[15] Metrologia, p. 78 ff.

qa has always been a measure of liters 1.0044. On this basis we attribute to the Babylonian and to the Assyrian measures of capacity the values indicated in the following tables.

In the presargonic period of Entemena of Lagaš and his successors the gur used was the gur-sag-gal.[16]

gur sag-gal	liters	144.56	1				
gur of 2 *ul*	"	72.28	2	1			
ul	"	36.14	4	2	1		
ban	"	6.02	24	12	6	1	
silà	"	1.004	144	72	36	6	1

Sumerian	Akkadian								
gur lugal	kur šarri	liters	301.3	1					
ban ià	hameš sâti	"	50.02	6	1				
ban limu	irbi sâti	"	40.06	7½	1¼	1			
ban áš	ṣimdû	"	30.12	10	1⅔	1⅓	1		
ban min	sitti sâti	"	20.08	15	2½	2	1½	1	
ban	sûtu	"	10.04	30	5	4	3	2	1
silà	qa	"	10.04	300	50	40	30	20	10	1

The gur lugal was measured also with the *sûtu* of 5 qa and with the *sûtu* of 6 qa and with a *sûtu* of 12 qa.[19, 20]

The Assyrians used as measure of capacity the *imēru* of 100 qa which was divided as follows:

imēru	liters	100.4	1			
PI	"	60.26	1⅔	1		
sûtu	"	10.04	10	6	1	
qa	"	1.004	100	60	10	1

There was also an *imēru* of 80 qa (see p. 79).

The PI [21] a Babylonian measure could have been a double Babylonian talent. In the Neobabylonian system the gur was divided in 180 qa as follows:

gur	liters	180.7	1				
unit of 36 qa	"	36.14	5	1			
sûtu	"	6.024	30	6	1		
qa	"	1.004	180	36	6	1	
mana	gr.	502	360	72	12	2	1

The PI = 60 qa equal to 120 minae was the measure of capacity called by Herodotus Persian artaba.[22] But Herodotus [23] says that the Persian artaba was a measure 3 choenices larger than the (Attic) medimnos i. e., that the Persian artaba 3600 gur sag gal made a guru. In this period units of 2, 5, 10, 30, and 60 silà were used.[17]

Later in the texts of Telloh, in the age of Sargon, in the documents of the dynasty of Ur III, and under the first dynasty of Babylon and during the Cassite age [18] the gur used was the gur lugal divided as follows:

was a measure of liters 55.67. The double talent corresponding to liters 60.26 would have been equal to ca. an Attic medimnos plus 8 choenices. Possibly the statement of the text of Herodotus is not correct. The other data on Persian metrology from Greek sources are not of much help. Greeks stated that the artaba was a sort of medimnos.[24] Probably the Greek medimnos the artaba was divided in sixths, the artaba was divided in 6 *sûtu* of 10.04 liters.[25]

The artaba very probably was divided in smaller units which are called kapīč in Persian, *καπίθη* by Xenophon and *καπέτις* by Hesychius. Xenophon attributes to the *καπίθη* the value of 2 choenices An 1, 5, 6, Polyaenus, 4, 3, 32 1 choenix, Hesychius, Metrol. Script. 319, 23 2 cotylae or 2 choenices.[26]

The only reliable Jewish sources on the kapiza say that the kapiza is smaller than an issaron, i. e., a tenth of an ephah; liters 2.18, and that it is smaller than the kab of Meloga T. B. Pessahim, 48. b of the end of the 3rd century A. D. The kapiza is less than a cab in R. B. Shabbath, 103a. These passages referring to the Jewish challa

[16] The volume of the gur sag gal appears to have been near to the cube of a cubit of mm. 525. See, however, p. 79.
[17] Metrologia, p. 112.
[18] Metrologia, p. 113.
[19] Metrologia, p. 113.
[20] For Egyptian parallels see Metrologia, p. 113 ff.
[21] Metrologia, p. 113 f.
[22] See p. 77.
[23] Herodotus I, 192.
[24] It was considered as a medimnos by Polyaen. 4, 3, 32 Metrol. script. 313 Hesych. 334, 15 Suida 347. 23 Etym. M.
[25] See Metrologia, p. 105. Possible the Persian maris to which Polyaenus attributes 10 Attic choes was a measure equal to half artaba. The data on the maris are conflicting. See Metrologia, p. 105.
[26] Metrologia, p. 105.

show that a kapiza was a measure very near to the Syrian cab of liters 2.18 equal to 2 Attic choenices. Probably the kapiza was equal to a double qa or to liters 2.004. The Persian artaba in this case had been a measure divided as follows:

artaba	60.24	1						
measure of 36 qa	36.14	1⅔	1					
sûtu of 12 qa	12.04	5	3	1				
sûtu of 10 qa	10.02	6	3⅗	1⅕	1			
sûtu of 6 qa	6.024	10	6	2	1⅔	1		
kapiza	2.004	30	18	6	5	3	1	
qa	1.002	60	36	12	10	6	2	1

From the Neo-Babylonian measure of 6 *sûtu*, equal to 60 qa, were derived the Persian artaba and the Syrian metretes. The latter was the homologous measure to the Persian artaba with the Babylonian mina of gr. 502 replaced with the sextarius or Greek hemina.[27] The parallelism between the two measures is shown by the following table, where the first figures refer to the Hellenistic and the second to the biblical standard:

metretes	liters 65.49-62.88	1					
Syrian artaba	" 39.3-37.73	1⅔	1				
Jewish holy saton	" 10.91-10.48	6	3⅗	1			
Measure of 3 cab	" 6.54-6.29	10	6	1⅔	1		
Syrian cab	" 2.18-2.096	30	18	5	3	1	
ὑφεί = issaron = choenix	" 1.09-1.048	60	36	10	6	2	1
Syrian sextarius or log	" 0.545-524	120	72	20	12	4	2	1

Measures of land

The Babylonians and Assyrians measured land with units of land corresponding to units of capacity and thus it was made in Syria and in Palestine.[28] The proportion between the iugerum and the modius of seed in Syria and in Palestine is 1 iugerum = 3 modii italici[29] while in Egypt, actually 1 iugerum actually corresponded to ca. 4½ modii.

Reckoning the Babylonian cubit of mm. 301 as 10/9 of the Roman cubit, a Roman iugerum had been equal to 10368 Babylonian cubits square and a square of 100 × 100 Babylonian cubits would have corresponded to 3.24 modii. On this basis 100 SAR square, a measure of 120 × 120 Babylonian cubits square, had corresponded to 4.65 modii. A modius italicus of liters 8.73 is equal to 0.869 *sûtu* of 10 qa of liters 10.04. Therefore, 100 SAR of land would have corresponded to 4.05, let us say 4 *sûtu* of land if the Babylonians had reckoned with the density of seed of the Syrians.

These data make easier our calculations of the measures of land in Babylonia and in Assyria. The relations between the quantity of seed and the sown areas are expressed in two tablets published by Hilprecht BE XX_I n. 30 and attributed by him to the Cassite age, by Thureau-Dangin (U Q M, p. 84, n. 1) to the Neo-Babylonian. The two tablets say:

an-ni-ti šu-si *šá 30* šu-si-meš i kùš *am-mat* še-numun *u* gi-meš	This (list contains measurements of the) fingers (system where) 30 fingers equal one cubit (to measure) surfaces and lengths (one and two dimensions).
šá 1 a-da-pà *am-mat našpaku ù agarrinu ù 1* kùš ṣillu	1 a-da-pa has one (of these) cubit(s) in *našpaku* and in *agarrinu* and one in *ṣillu*
an-ni-ti šu-ši *ša 24 šu-ši-meš* 1 kùš *am-mat še-numun u gi meš šá*	Such is the finger of which 24 make a cubit, cubit which is used for measuring the land, in quantity of seed and in square rods.
100 U uš 100 U sag 5/30 3 qa ⅓ GAR *ša* še numun ù gi-meš 60 + 60 [+ 60] + 20	100 of these cubits of length and 100 in weight [correspond] to 33⅓ qa GAR of seed or to 200 square rods.

[27] See on this purpose, Metrologia, p. 103.

[28] See p. 78.

[29] See p. 78.

The meaning of the tablets is the following: there is a cubit which is used for measuring the land and the quantity of seed corresponding to the land. The a-da-pa is the cube of such a cubit (a measure of 125 qa). There is also a cubit of 24 fingers which is used for measuring the land. A square of 100 × 100 cubits of 24 fingers is equal to 33⅓ qa or to 200 rods square.

The relation 100 × 100 cubits² of 24 fingers = 200 rods square shows that 1 rod square was equal to 50 cubits square of 24 fingers or that a rod was equal to $7\frac{1}{14}$ cubits of 24 fingers. The cubit of 30 fingers was used also for the measure of land. The rods square were the gi or qanû of 6 cubits of 30 fingers. Therefore, the cubit of 24 fingers was a measure of $\frac{6}{7.07}$ cubits of mm. 501. The ratio between the two cubits was fixed at $\frac{6}{7}$. The small cubit of 24 fingers was therefore a measure of mm. 429.4.[30] Furthermore, the 33⅓ qa were equal to a GAR or 100 × 100 cubits² of 24 fingers or to 200 rods square. A qa, therefore,

33⅓ *sûtu*	1										
gur	1⅙	1									
6 *sûtu*	5⅚	5	1								
33⅓ qa = GAR	6	5⅔	1⅔₂₅	1							
sûtu	33⅓	30	6	5⅚	1						
qa	200	180	36	33⅓	6	1					
NINDA square or SAR	300	270	54	30	9	1½	1				
rods square	1200	1080	216	200	36	12	4	1			
cubit square	43200	38880	7776	7200	1896	216	144	36	1		
small cubit square	60000	54000	1800	10000	1800	300	200	50	1²¹⁄₇₅	1	

A gín of 300 qa would have been equal to 450 NINDA square 64.800 cubits square or 90,000 small cubits square and consequently 30 qa = 45 NINDA = 6480 cubits square = 9000 small cubits square. In the measures of the kudurrû Thureau-Dangin R. A. XVIII, 1921, p. 134, gives the following equations for the period when the gur was a measure of 300 qa:

gurrû	1			
measure of 6 *sûtu*	5	1		
ṣimdû = 3 *sûtu* = Ikû	10	2	1	
sûtu	30	6	3	1

A *ṣimdû* of seed = 1 ikû measured with the *ammatu arê* 120 × 120 arê. Thureau-Dangin understands incorrectly ammatu arê as a step equal to 1½ ammatu of 30 fingers. It is easy to show that the ammatu arê was the foot of the cubit.

was equal to 300[31] cubits square of 24 fingers (429.4 mm.) or to 216 cubits square of 30 fingers (501 mm.).

The basic relations between quantity of seed and land sown in the Neo-Babylonian age are:

33⅓ qa = GAR of seed = 7200 royal cubit square = 10,000 small cubit square. Rod square, gi or qanu = 6 × 6 royal cubits square = 50 small cubits square.

The density of seed, starting from 1 qa = 300 cubits square of 24 fingers, in Roman measures would correspond to 1 iugerum = 2.916 modii, a figure very near to the Syrian-Palestinian 1 iugerum = 3 modii.

The existence of the small cubit of 24 fingers is confirmed by Herodotus I 192 who asserted that the royal cubit was 3 fingers larger than the μέτριος cubit. The difference of mm. 72 between the two cubits can be evaluated at 3 fingers. The measures of the Kudurrû where a qa corresponds to 300 cubits of 24 fingers square give the following relations:

[30] In Cyr, 128 Kohler Peiser, Aus dem Babylonischen Rechtsleben II, p. 29 and p. 32 n. 1. (Metrologia, p. 116) An area of 433⅓ square cubits is reckoned at 8⅔ rods square. A rod square is made equal to 50 cubits square. Those cubits are the small cubit of 24 fingers of mm. 429.4. The same measure is found in Nbn 1128 (Kohler Peiser, ibid. II, p. 70. Metrologia, p. 116.)

Here the measures in cubits are given in small cubits. The rod is a measure of 6 cubits corresponding to 7 small cubits.

The supposition (Metrologia, p. 116) of the qanû of 6 large cubits equal to the qanû of 7 small cubits and of the cubit of 30 fingers equal to 7/6 of the cubit of 24 fingers was correct. In Sasanidian Persia there was a cubit of Cosroes. H. Sauvaire JA VIII, 1886, p. 510 equal to 7/6 of the ordinary cubit. (Metrologia, p. 119) This proportion is the same that we find in Babylonia between the large and the small cubit.

[31] This ratio 1 qa of seed = 300 cubits square had been stated by Oppert, Thureau-Dangin l'U le Qa et la mineé, Révue Asiatique 1909, p. 110 n. 1. But the explanations of Thureau-Dangin that the table of the temple of Bêl shows that this cubit is an ordinary cubit of 30 fingers called also ammatu suk-lum and ammatu siḫrtu (opposed to the ammatu rabitu) which according to him was the step (cp. RA XV, p. 59) are not correct.

The Neo-Babylonian rate was 30 qa = 80.50 × 80.50 royal cubit square. In the Babylonian kudurrû we have 30 qa = 120 × 120 *ammatu* arê square. It is clear that the proportion seed to land was here the same as in the Neo-Babylonian texts: the *ammatu* arê was ⅔ of the Neo-Babylonian *ammatu*. The *ammatu* arê is certainly a measure of ⅔ of the royal cubit of 30 fingers, a foot of 20 fingers i. e., a measure of mm. 334.[32]

The measures of the ancient Babylonian kudurrû given by Thureau-Dangin, R. A. XVIII, 1921, p. 134, based on the equation 3 *sûtu*; 120 × 120 *ammatu* arê or 3 *sûtu* = 80 × 80 *ammatu rabîtu* of 30 fingers are the following:

Bur	1							
ese	3	1						
Ikû = 3 *sûtu*	18	6	1					
ubu	36	12	2	1				
qa	540	180	30	15	1			
NINDA square or SAR	810	270	45	22½	1½	1		
cubit square	116.040	38.680	6.480	3240	216	144	1	
cubit arê or foot square	259.200	86.400	14400	7200	480	320	2¼	1

The SAR was further divided in 180 *še* according to Thureau-Dangin, Le grain mésure de surface R. A. XXV, 1938, p. 156 ff.

Measures of lengths and weights of Nuzi generally are in accord with the Babylonian standards. Nuzi used also a foot, *šēpu*.

The measures of capacity are Assyrian. The *imēru* has there 100 qa and sometimes 80 qa.[33] The measures of area are Assyrian. The *imēru* unit of land was divided in 10 aweḫaru, the correspondent of the sûtu of 10 qa.

H. Levy, La mésure de l'imēru dans les textes de Nuzi, R. A. XXXV, 1938, p. 33 ff. gives the equation imēru of land = 8000 GIR square. If we start from the Neo-Babylonian equation qa = 300 cubits of 24 fingers square we have *imēru* = 30000 cubits square or GIR square = ⅜ of 3¾ cubit of 24 fingers square. If we start from the relation 3 *sûtu* = 120 × 120 *ammatu* arê square we would have *imēru* = 48,000 cubit arê square. A GIR consequently could have been equal to 6 cubit arê square or 2⅔ royal cubits square. H. Levy quotes the text AASOR XV n. 22 were the measures of an orchard are on the four sides 47 GIR, 43 GIR, 7 GIR, and 2 *ammatu*, 2 GIR and 2 *ammatu*. Certainly the GIR is a measure of more than two *ammatu*. But the GIR is not a square but a measure of length of 2⅔ *ammatu* of 30 fingers, which as measure of area was reckoned 1 cubit × 2⅔ cubits. To the measure of length of p. 74 we have to add as important new items the ammatu arê or foot = 20 fingers, the GIR of 2⅔ cubits and the ammatu ṣiḫîrtu or small ammatu of 24 fingers of mm. 429.4.

No cubit of mm. 525 seems to have existed in the Babylonian and in the Assyrian metrology. The cubit of mm. 525 would have been ca. $2\frac{1}{20}$ of the cubit of mm. 501 and this cubit 1.176 small Babylonian cubits of mm. 429.4.

The fraction which expresses the relation between the cubit and the small Babylonian cubit was ⅞ = 0.857 which is very near to the more correct figure 0.85. This ratio of ⅞ of the two cubits derives from the proportion cubit small square = cubit square 0.72. The Assyrian and the Babylonian introduced the small cubit as a measure which transformed 72 square large cubits in 100 small cubits. They reckoned rather accurately $\sqrt{0.72}$ as equivalent to ⅞.[34] Both had a royal cubit equal to 28 fingers of a smaller cubit.

Another cubit, which we call the large cubit was a measure of ¾ cubits of 626.2 mm. We know of its existence from a measure, apparently equal to 7½ cubits of 501 mm. This measure gives the solution of Thureau-Dangin RA XXXII, 1934, Problem VI p. 10.[35] Thureau-Dangin RA XXIX, 1931, p. 189 ff.[36] presents two problems which may be resolved supposing the existence of a finger of 27.75 mm. equal to 1⅔ of the ordinary finger of 16.65 mm. If the fingers of 27.75 mm. are fingers of the *ammatu* of 626.2 mm. this cubit would have been the equivalent of 22½ large fingers and its *qanû*, a measure of 135 fingers. We do not know if the large and the small cubits had multiples homologous to the multiples of the cubit of 501 mm.

[32] 450 NINDA square are reckoned as 80 x 80 royal cubits square instead of 80.5 x 80.5 royal cubits square.
[33] See p. 75.
[34] See for the Egyptian measures, Metrologia, p. 113 f.
[35] See p. 80.
[36] See p. 80.

Some resolutions of Babylonian metrological problems

Our research makes it possible to give accurate solutions of metrological problems which in our opinion have not been correctly resolved. We deal with only a few problems, but, if we are not mistaken, a far larger amount of metrological problems may be resolved with the measures determined by our research.

In Thureau-Dangin R. A. XXXII 1935, p. 14, it is stated that a baquet the volume of which is $^{1}\!/_{36}$ of a cubit³ contains 29 qa. According to the interpretation of the text by Thureau-Dangin it is said that $1/6 = 12$ qa = *šulu* of grain or $1/4 = 12$ qa = *šutu*. Thureau-Dangin reckoned with a qa of $74\,^{6}\!/_{7}/125$ of the qa of 1,004 liters. He is certainly mistaken.

The cubit used in this problem is a small cubit of 24 fingers equal to mm. 429.4. According to the relation $^{1}\!/_{36}$ cubic cubits = 29 qa the cubit here is a small cubit. The small cubit cube is equal to $74\,^{6}\!/_{7}$ qa. Babylonians reckoned with a cubic small cubit equal to 75 qa i. e., $^{125}\!/_{75}$ or $5/3$ of the cubic cubit. The small cubit of 24 fingers was reckoned as $6/7$ of the cubit of 30 fingers of mm. 501 = its square at $^{5}\!/_{36}$ (instead of $^{4}\!/_{36}$) of the square cubit. Concluding the two cubits in the calculations of the Babylonians were in a ratio of $6/7$, their square of $^{5}\!/_{36}$, their cubes of $5/3$.

The SAR, measure of volume, amounts to 12 cubic cubits—not to 144 cubic cubits as it was supposed by Thureau-Dangin, R. A. XXIX, 1932, p. 192. A SAR of volume equal to 12 cubic cubits appears in BM 85 194 VI 7012. In this text where a boat carries a SAR of bricks, it is asked how much it carries of grain. The answer is 8 kur + 1 PI + 40 qa. The kur of the text is the Neo-Babylonian kur of 180 qa, not the kur of 300 qa as supposed by Thureau-Dangin: 8 kur + 7 PI + 40 qa correspond to 1500 qa. But 1500 qa at the ratio cubic cubit = 125 qa are equal to 12 cubic cubits. The SAR volume in the same text is made equal to 720 bricks, each brick of $1/60$ of a cubic cube corresponding to the volume of $2\,^{1}\!/_{12}$ qa or dm³ 2.09. The calculation of Thureau-Dangin and Scheil R. A. XII 162 are not correct. The problems of Thureau-Dangin R. A. XXXII, p. 6 ff., III, IV, V and generally all the problems where he supposes that the SAR volume is equal to 144 cubic cubits, have, in my opinion, to be revised.

In Thureau-Dangin R. A. XXXII 1935 probl. XII and XIII, p. 16 ff. when the rope of the length of a berû corresponds to 30 × 60 gar but to 35 × 60 gar (see p. 17). Thureau-Dangin could not realize that the cubit which measured the *bêru* was a small cubit of mm. 429.4.

Thureau-Dangin R. A. XXXII 1934 Problem VI, p. 10 deals with the following proportion: A cylindrical container with the circumference of the basis equal to $^{3}\!/_{60}$ and the height equal to $^{4}\!/_{60}$ contains 60 sûtu, each of 129 qa. The unit of length used in the problem appears to have been a sort of qanû of 6 cubits, but these cubits are certainly larger than the cubits of the ordinary *ammatu* of 30 fingers.

We indicate this rod of 6 cubits with x. The problem of Thureau-Dangin gave the equation $50''$ or $1/72\ x^3 = 60$ *sûtu* = 720 qa. 720 qa as we know is equal to $^{72}\!/_{125}$ cubic cubits or 5.76 cubic cubits. $x^3 = 5.76$ cubic cubits = 414.72 cubic cubits. The square root of 414.72 is 7.504. x therefore is a rod of 7.50 cubits. We assume this rod to have been equal to 6 large cubits. Therefore we suppose that the rod which we have indicated with x is a rod of 6 large cubits each equal to $5/4$ of the cubit of mm. 501. If we are correct the Babylonians used also a cubit equal to $5/4$ of the cubit of 30 fingers whose qanû was a measure equivalent to $7\,^{1}\!/_{2}$ cubits.

Thureau-Dangin gives another solution to the problem which is manifestly not correct because even its arithmetic is inaccurate. He makes the measure of $50'' = 1/72$ equal to $1/72$ SAR which he understands as 144 cubic cubits.

We do not know how this cubit was called by the Babylonians, but its existence appears to us extremely probable. We call it large cubit.

If we are correct we are confronted with three Babylonian cubits: a large cubit of mm. 626.2, a cubit of mm. 501, and a small cubit of mm. 429.4.

The proportions of the cubits were the following:

large cubit mm.	626.2	9		
cubit	501	$1\,^{1}\!/_{4}$	1	
small cubit	429.4	$1\,^{1}\!/_{24}$	$1\,^{1}\!/_{6}$	1

The ratios of the cubes of those cubits were reckoned approximately as follows:

large cubit³ = 1.92 cubits³
cubit³ = $1\,^{2}\!/_{3}$ small cubits³
the large cubit³ = 240 qa; the cubit³ = 125 qa; the small cubit³ = 75 qa.

If these suppositions are correct, supposing that the multiples of the large cubit have the same denominations as the multiples of the cubit, we would expect the following divisions of the danna-*bêru* in large cubits:

danna *bêru* m.	10821.6	1					
giš of the large cubit	445.09	24	1				
zir of the l. cubit	75.14	144	6	1			
NINDA of the l. cubit	7.514	1440	60	10	1		
gi of the l. cubit	3.757	2880	120	20	6	1	
large cubit mm.	626.2	17280	720	120	12	6	1

Of the large cubit we are supposed to know only a *qanû* of 6 large cubits. Eventually the large cubit would have been equal to 37½ fingers of the cubit of mm. 501 or to 35 fingers of the cubit of mm. 429.6. 6 large cubits would have amounted respectively to 225 and to 210 fingers.

Two other problems point to the existence of larger fingers than those of the two cubits of 501 and 429.6 mm. The two problems of Thureau-Dangin R. A. XXIX, 1931, La mésure du qa, p. 189 ff. show a qa of 45 fingers cube; BM 85194 col IV 44-46 and BM 85194 col V 1-6 give both the same results. In the first problem the units are not said to be fingers, but in the second problem, the dimension depth is indicated with fingers. The two problems have the same metrological solution. In the second problem of Thureau-Dangin there is a container, a cylinder, whose diameter is 2 fingers and whose height is 15 fingers. 45 large fingers[3] are made equal to one qa. These large fingers are obviously not the fingers of the cubit of mm. 501 and not the fingers of mm. 429.4. The qa is equal to the cube of 6 fingers therefore, 45 large fingers^3 = (6 fingers)^3. Large finger $\sqrt[3]{45}$ fingers of the cubit of mm. 501. The Babylonians with a small error considered 3.6 as $\sqrt[3]{45}$. ($3.6^3 = 46\frac{2}{3}$) It follows that the large finger was $^1/_{36}$ of the finger of the cubit of mm. 501. 18 large fingers were equal to a cubit of mm. 501. We do not know how many fingers was the cubit to which those fingers belonged. If the *qanû* of the large cubit was 135 such fingers, its cubit had been 22½ large fingers.

SOME DEVELOPMENTS OF THE SEMITIC ROOT *'b y*

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For many years the way to a right understanding of the Semitic root *'b y* and of certain of its derivatives has been blocked by the supposition, to which Nöldeke's adherence [1] gave weighty support, that the Hebrew verb אָבָה signifies originally and properly 'refuse, be unwilling,' and that the negative found with it in fifty out of the fifty-two Biblical occurrences of the verb is strictly redunant and is introduced simply for emphasis. Against this supposition the fact that except in nominal sentences with אין and after privative and quasi-privative words such as מן and טרם pleonastic negatives are not used in Biblical Hebrew is not decisive.[2] But the one clear case of אבה 'be willing' unaccompanied by any negative [3] cannot be ignored.[4] Nor can the indications afforded by its derivatives תַּאֲבָה 'longing, desire,' תְּאֵב 'yearn, long for,' [5] whence אָבוֹן(י)ת 'appetite, hunger' and its congeners in Accadian and Aramaic, in which the same positive sense obtains. In Arabic itself the meaning 'be willing, desire, incline,' is found for أبى in a variety of dialectal material listed by

[1] *Beiträge zur Semitischen Sprachwissenschaft* (1904), 66.

[2] Cf. Brockelmann: *Grundriss der Vergleichenden Grammatik der Semitischen Sprachen*, II (1913), § 107b, Anm. 2.

[3] Isaiah i 19. Job xxxix 9 is not to be reckoned another instance, being a rhetorical question expecting a negative answer.

[4] Nyberg's question 'Wie viele Belege verlangt man denn, um ein Wort als existierend anzuerkennen?' (*Studien zum Hoseabuche* (1935), 52) is as pertinent in matters of syntax as in lexicography.

[5] It is unlikely that the chronological sequence of the two forms is other than that suggested here, תאבה being a noun of the *taqtalat* type, and תאב a denominative back-formation. Roots containing weak letters are partial to noun-formations of this and similar types on account of the compensatory consonant; cf. Albright in *JBL* XLVI (1927), 180-185 and the Phoenician examples noted by the writer in *JEA* XXVI (1940), 63. תאב has analogies in the denominatives תאם, תוה, תכן, תעב, and Ugaritian *t r b*, on which see *BASOR* 65 (1937), 31, 71 (1938), 38, n. 29 and *RHR* CXXI (1940), 8 sqq.

Gesenius-Buhl[17] (1921), though not all available when Nöldeke wrote. In point of time and of place the meaning 'be willing' is much more widely attested than the meaning 'refuse,' so that there is no inherent difficulty in holding that the accompanying negative in Hebrew is not redundant.

The question whether the primary meaning of the root is 'refuse,' whence 'make a conventional refusal that signifies a seemly assent' or is 'agree' whence 'agree simply for form's sake,' i. e. 'reject' does not arise.[6] For the primary meaning of the root survives in Canaanite אביון 'in want, needy, poor' and in Arabic أبى IV 'be lacking, deficient, scanty' (especially of water and milk) and kindred forms.[7] From the idea of 'deficiency' it is an easy transition to that of 'rejection, refusal.'[8] But the transition from 'be in need' to 'express one's need' is equally easy.[9] And thus while the former development represents the history of the root in Classical Arabic and Ethiopic, in all other parts of the Semitic-speaking world, including those Arabic vernaculars in which the normative influence of Qur'anic Arabic was not effective, the root acquired the sense 'desire.'

Within Hebrew the verb אבה underwent a semantic deterioration. From 'need, want, desire' it came to mean no more than 'consent, be willing, yield, grant, agree.'[10] This deterioration may account for its frequent occurrence with a negative in a phrase meaning 'not (even) consent,' i. e. 'refuse,' and possibly to some extent also for the development of the secondary תאב. The sense 'yield, grant' is also to be found in a hitherto undetected imperative, pointed by the vocalisers as אָבִי, in II Kings v 13 and Job xxxiv 36. The form retains its original vowel *i*[11] in a proclitic position[12] and ought therefore to carry no main accent and to reduce the *qameṣ*. In Job the word is used as an expression of fervent wish;[13] in II Kings v 13 it introduces the protasis of an unreal conditional sentence,—'Granted it had been a big thing that the prophet had named to you, would you not have done it?'[14]

As Ewald recognised,[15] the form אבי just discussed cannot be separated from the well-known particle בִּי. The latter must accordingly be accounted for as a form in which the *Systemzwang* so prevalent in the inflections of verbs *pe aleph*[16] has not operated and the initial *aleph* has disappeared, as in similar forms in Arabic.[17] It may or may not be an accident that the word is always correctly used in addressing a single superior; and so we cannot tell how fossilised the form was when it disappeared from use, as it seems to have done before the exile.

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[6] The former of the two developments mentioned would have a close parallel in the motto on a decanter in the writer's possession,—'Dae as the lassies dae, say No an' tak' it!' Either development would be quite in keeping with Semitic mode of thought, in which ideas of politeness, religious scrupulosity and fear of the evil eye are inextricably interwoven. Gordis gives instances from Biblical Hebrew of such transitions of meaning in *JQR* XXVII (1936), 33-58; cf. *AJSL* LV (1938), 270-284. The number of real أضداد, i. e. words having two diametrically opposite meanings in the same dialect and at the same period is smaller than the schematisations of Arab lexicographers and the bold generalisations of some Occidentals would indicate. Nöldeke has illustrated some of the tendencies at work in the production of true and apparent أضداد in his *Neue Beiträge zur Semitischen Sprachwissenschaft* (1910), 67-105.

[7] See Lane: *Arabic-English Lexicon*, 12b-13a.

[8] Cf. our 'be without'–'(prefer to) do without.'

[9] Cf. δέω–δέομαι, 'fehlen'–'befehlen.'

[10] Similarly ἀγαπάω 'show affection, love' then 'be contented, put up with,' whence ἀγαπητός of an only child 'wherewith one must be content.'

[11] Cf. Arabic يَأْبَى (Wright: *Arabic Grammar*[3], I (1896), § 175 Rem. b. Similar forms occur in Jeremiah iii, 6, xviii 23; cf. Bauer-Leander: *Historische Grammatik der Hebraischen Sprache* I (1922), § 57 t".

[12] Bauer-Leander, *op. cit.*, § 14 s, Brockelmann, *op. cit.* I (1908), § 42 ff. β.

[13] Cf. Targum ad loc.

[14] Only a few MSS of the LXX, cited by Field: *Hexaplorum* ad loc. in n. 24, read εἰ μέγαν λόγον. The reading πάτερ εἰ μέγαν λόγον of LXXLuc is probably not a conflate reading but a translation *ad sensum* like those of the Targum and Pesitta. In Genesis xi 4 the synonymous הָבָה introduces what is virtually a conditional sentence,—'If only we can . . . , then we can get a lasting name.' In Arabic هَبْ is similarly used, as one of the أفعال القلوب to introduce an unfulfilled condition; cf. Lane, *op. cit.*, 2969a. The subordinating force of these imperatives is precisely parallel to that of English 'suppose.'

[15] *Ausführliches Lehrbuch der Hebräischen Sprache* ([8] 1870), § 101 c.

[16] Bauer-Leander, *op. cit.*, § 25 d, j.

[17] Wright, *op. cit.*, § 175, Rem a.

BRIEF COMMUNICATIONS

Corrections to 'The Epic of Gilgameš and Its Sumerian Sources'

Because, unfortunately, I did not have the opportunity to see the page proofs of 'The Epic of Gilgameš and Its Sumerian Sources,' the study contains a number of wrong cross-references and several textual errors which are to be corrected as follows:

In the fourth line of note 5, 'parallels' should read 'parallel'; in the last line of note 13, '18' should read '19'; in the twenty-fifth line of note 15, a closing parenthesis is to be substituted for the comma following GIŠ; in the first line of note 30, the number '23' has been omitted in front of the number '27'; in the sixth line of note 36, 'x. y. x.' should read 'x. y. z'; in note 43, '12' should read '15'; the words 'man of life' on pp. 13, 14, and 18, should read 'living man'; in the first line of note 48, one 'that' is superfluous; in the fifteenth line of the same note, the number '6' is to be inserted after *SRT*; in the third line of the first column of p. 14, and in note 50, the word 'builder' should read 'creature'; in the eighth line of the first column of p. 14, 'perhaps' is to be inserted before 'to guide'; in the thirty-first line of the same column 'was' is to be inserted after 'order'; at the very end of note 49, 'in the Nippur tablets' is to be added after 'his name'; in note 52, '13' should read '16'; in the second line of note 61, 'rev.' is to be inserted after '25'; in note 65, '18' should read '19'; in the eleventh line of the first column of p. 18, 'pp. 8-9' should read 'p. 13'; in the sixth line of note 82, '9' should read '13'; in the thirteenth line of the same note, '17' should read '19'; in the eighth line of the second column of p. 18, the closing parenthesis has been omitted before the question-mark; in note 88, '19' should read '20'; in note 91, '9' should read '13'; in the thirty-fourth line of the second column of p. 21, '18' should read '20'; in the second line of note 109, the numeral '6' has been omitted after the first syllable -ni-; at the very end of p. 22, 'line 45' is to be inserted after 'U 9364'; in the twenty-third line of the first column of p. 23, '52' should read '48'; in note 113, 'RM' should read 'Rm.'

S. N. KRAMER

REVIEWS OF BOOKS

Hittite Hieroglyphs III. By IGNACE J. GELB. Chicago: THE UNIVERSITY OF CHICAGO PRESS, 1942. Pp. xix + 75. The Oriental Institute of the University of Chicago. Studies in Ancient Oriental Civilization, No. 21.)

I. Gelb, who has done much for the decipherment of the Hittite hieroglyphs, presents in this small book corrections and additions to his previous contributions to the same problem (the first part was published in 1931, the second in 1935). The progress achieved can best be judged from a comparison of the syllabaries which are offered as a frontispiece in each of the three parts.

The decisive stage in the decipherment had obviously been reached in 1935. Most phonetic signs had been recognized by then and found a reasonable interpretation. It was in the second part also that the author's thesis—his most significant contribution to the decipherment—that the hieroglyphic syllabary contains only signs that consist of a consonant and a vowel was conclusively demonstrated.

In part III only three sign values have been changed (*za* is now read instead of *ti*, *ze* instead of *ke*, *zi* instead of *ke*). Five symbols have been more exactly defined as to their vowels (*ri, su, te, ti, we*), one as to its consonant (*śa*). Eight signs appear here for the first time with definite values (*ē, ya, yā, mi, pu, śi, śu, zu*). Five symbols are still left undeciphered.

The decipherment is apparently approaching finality. Hence it may be worthwhile reviewing the procedures upon which the decipherment is based and evaluating their respective cogency. It may be stated in advance that it is frequently the cumulative force of various arguments which makes an assumption, introduced as a working hypothesis, more or less probable. I list the procedures according to the force they carry.

(1) Bilinguals do not play any great part. All the alleged bilinguals (the Tarku "timme" text not excluded [1]) require more elucidation than they can offer.

(2) The identification of proper names, geographical and personal, is the mainstay of the decipherment.

The assumption that names of localities (recognizable by their determinative) recurring in several inscriptions of identical provenience represent most likely the ancient name of that place has proved fundamental. Such names are *Amatu, Gurgumu, Kargamiš, Tuwana, Mera,* and (to mention Gelb's personal contributions) *Naḫita,* and perhaps *Semiraka.* This yields the following values: *a, ḫi, ka, ku, ma, me, mi, na, ra, se, śa,*[2] *ta, tu, wa.*

It is likewise probable that the names of kings of the respective places (known from other sources) can be found again in the hieroglyphic inscriptions. Special care had to be taken, however, to compare a genealogical sequence of kings rather than individual kings. Such names are *Warpalawa, Muwatalli, Urḫilina, Ḫalparuda,* and (these contributed by Gelb) *Sangara,* and *Tarḫun(a)zi.* By these equations the following additional values are well established: *u, ḫu,*[3] *la, li, mu, pa, ru, t(e).*[4]

The deity *Ḫebat,* and furthermore the queen *Pudu-ḫeba* [5] may be added here. Their names provide the signs for *ḫe* [6] and *pu.* There is also *Nikarawa-* (Gelb, AJSL 55 200 ff.), a name which contributes the value *ni.*

One must beware of mere assonances. Identification must be warranted by the circumstances; mere identity or similarity of outside names with

[1] This much discussed object is dealt with anew on p. 26 ff. It seems to me by no means certain that the last word has been spoken yet. The new reading of the hieroglyphs as *Tarḫu-zi* is unconvincing; the sign read *ei* seems not to be identical with the one read *zi* elsewhere.

[2] For the differentiation of *s* and *ś* see below sub (5).

[3] It would have been preferable to base this value on the name *Tarḫun(a)zi.* Gelb makes use of an alleged *ḫu-ḫa-* "grandfather" which is arrived at by etymology (see below sub (7)).

[4] My transliteration *t(e)* means that only the consonant is certain.

[5] It is noteworthy that the Ḫurrian name *Pudu-ḫeba* had to be spelled out phonetically. The (Ḫattic) names of the Hittite kings of the Younger Kingdom are all written ideographically (see H. G. Güterbock, APAW 1935, phil.-hist. Klasse No. 1 62 ff.).

[6] I should reverse Gelb's values *ḫe* and *ḫa.* The equation between the name of the Fraktin queen and that on the Tarsus seal with Ḫattušil's wife should take precedence over the rest of the evidence.

the occurrence in question, if no specific connection is established, is treacherous. For this reason the comparisons offered p. 14 fn. 1 (for *ri*), p. 17 fn. 2 (for *śi*), p. 23 fn. 3 (for *ti*) must be rejected.[7]

(3) Interchange of signs in identical words. Such interchange is due to inflection and involves in many cases merely a change in the final vowel. The choice of vowel, if not ascertainable by a following vocalic sign (see presently), is largely conjectural. From this source derive the values[8] *l(e)*, *n(e)*, *p(i)*, *s(e)*, *ś(i)*, *w(e)*.

(4) Addition of signs medially in otherwise identical words. These can only be vowels. From (2) we have already *a* and *u*; the two remaining must be *e* and *i*.

There exists apparently a second set of vocalic signs, the symbols for which are partly modifications of those for the first set. Gelb interprets them as nasalized vowels. Admittedly this assumption entails nazalization in many forms where there is no morphological justification for it; on the other hand a nasal is not expressed in numerous forms where it should be expected. In the circumstances, I wonder whether the assumption of an "Ablaut" (*ä, œ, ü*) does not explain the evidence better.

(5) Morphological parallels. What I mean is best explained by an example. If one finds in a sequence of nominatives besides forms in *s(a)* forms ending in an unknown sign, the conclusion is probable that the sign contains a modification of an *s* or an affricate with *s*. This argument contributes to the positing of *śi*, and also to the splitting of previously assumed *s* into *s* and *ś*, and of *t* into *t* and *z*.

(6) Structure of the syllabary. After a number of values has been established, it becomes apparent that they all consist of the sequence consonant + vowel. Statistical facts support this assumption.[9] Thus the argument can be advanced with progressing decipherment that the values of the undetermined signs must fit the gaps that are left open in the system of values. This helps in assigning, however tentatively, vocalic elements to the signs the consonantal component of which is fairly clear (see above sub (3)). One should of course prefer to have such values confirmed by subsequent identifications of names.

(7) Comparisons with cuneiform Hittite. Here we are entering disputed territory. The decipherment had better be carried through without resorting to etymological considerations. The value *ḫu* should not have been based on the comparison of a hieroglyphic word for "grandfather" with cun. Hitt. *ḫuḫḫaš*.[10] Nor can *za* be proved, or corroborated, by reference to an alleged *a-za-tu-u* "may they eat" arrived at on the basis of cun. Hitt. *ezzandu*.

(8) Indo-European etymology. Such evidence has very little value, if any.

To be sure, it is remarkable to find in hierogl. Hitt. words for "dog," "horn," and "horse" which in structure and sound are very close to IE. **k'(u)wōn*, **k'ṛn-*, and **ek'wo-*. Coincidence is almost certainly excluded. But does this entitle us to posit for the sign which begins the first two words the value *śu*? Even if *ku* is eliminated as a possible reading, because this value is assigned to another symbol (which however in terms of IE phonology may actually be *qu*), there may very well have existed another set of *k* sounds. No confirmation for the author's view can be derived from the syllables *ki* and *ke* which are said to be found at the beginning of the relative pronoun. These values are not arrived at independently. And in order to make their positing possible the signs which were originally supposed to have these meanings had to be accommodated otherwise (they have been shifted to *zi, ze*). Gelb's values *śu, ki, ke, zi, ze* are thus rather uncertain.

In no circumstances can the readings *śuwan-*, *śurn-*, and *aśuwa-* which the author advocates be admitted as evidence for the śatem character of hieroglyphic Hittite.[11] Such an argument is circular. That very hypothesis was instrumental in positing the values in question.

Not all, then, in Gelb's syllabary is certain, and not all equally probable. It seems that the understandable endeavor to furnish a complete syllabary has carried the author a little too far. It might

[7] Cf. Gelb's own criticism II 18.

[8] I have put the vowels between parentheses in order to indicate their uncertain quality.

[9] See particularly II 4 f.

[10] See fn. 3 above.

[11] Incidentally, the *n*-suffix in the word for "horn" is not favorable to the śatem hypothesis. It occurs only in centum languages.

have been better to admit that for some signs no value can be proposed with certainty and that further evidence must be awaited. There is every hope that the discovery of new inscriptions will settle the remaining uncertainties.

YALE UNIVERSITY ALBRECHT GOETZE.

Chanhu-daro Excavations, 1935-1936. By ERNEST J. H. MACKAY. Pp. xv + 338, 2 frontispieces and 96 plates. American Oriental Series 20. New Haven, Connecticut: AMERICAN ORIENTAL SOCIETY, 1943.

The Chanhu-daro excavations of 1935-1936 conducted by the late Ernest Mackay, were the first archaeological expedition directed and financed by organizations outside of India. This joint enterprise of the American School of Indic and Iranian Studies and of the Fine Arts Museum, Boston, the latter institution generously providing the financial support, was made possible by the amended Monuments Act, permitting foreign societies and organizations to engage in archaeological work in British India.

The first American expedition could not have been under abler direction than that of Ernest Mackay, who after years of brilliant work in Mesopotamia, for a number of years directed the excavations at Mohenjo-daro.[1]

The site of Chanhu-daro, on the left bank of the Indus, located roughly between Mohenjo-daro and the sea-coast, was selected as a result of the indications obtained during the late Mr. Majumdar's examination of the mounds in 1931.[2] At that time it was definitely established that this was a chalcolythic site of the same type as Mohenjo-daro and Harappa. As the reviewer understands it, the choice lay between Chanhu-daro and Amri, about twelve miles to the west and the site of the culture of that name. Difficulties with the local population at Amri, where there were numbers of Muhammadan graves likely to be disturbed by the excavations decided for Chanhu-daro.

While the work must be regarded as far from complete, for the site is much too extensive for one season's campaign, the following results may be briefly recapitulated. All the lower levels proved to belong to the Indus Valley Culture. Mackay prefers the name Harappa Culture, as several cultures have been discovered by now in the Indus Valley, and the reviewer is going to follow the late author's example. As at Mohenjo-daro it proved impossible to ascertain whether remains of an older civilisation, possibly that of the Amri type, were located below the lowest Harappa levels. Here too, sub-soil water was found, effectively preventing deeper digging. It seems that only expensive pumping apparatus can overcome this difficulty which is found at most of the Indus Valley sites. Above the uppermost Harappa levels Mackay discovered the Jhukar Culture, so named by Majumdar after the site where it was first discovered in 1931. The Chanhu-daro excavations seem to establish quite definitely that the Jhukar people came to this site considerably after the departure of the Harappa people. Concerning the dating of the Jhukar Culture and in regard to certain features of that civilisation I shall speak below. The highest levels of mound 2, the highest and largest at the present time, were occupied by still another people, those of the Jhangar Culture.[3]

Chanhu-daro, of the period of the Harappa Culture, proved to be a considerably smaller and poorer city than Mohenjo-daro. From the results thus far obtained it is clear that the majority of the inhabitants were artisans, engaged in various trades, of which bead-making was one of the most important. An account of the details of this trade has been published by Mackay on the pages of this JOURNAL (57. 1-15). It seems very likely that Chanhu-daro served as an export centre of this trade. Besides beads, seals and pottery were extensively manufactured. The seals are of the type so well known from Mohenjo-daro and Harappa, with the usual animal representations, in the case of the great majority that of the so-called unicorn. As elsewhere, virtually all of the seals are inscribed; the characters appearing in these brief inscriptions

[1] See his *Further Excavations at Mohenjo-Daro* (New Delhi, 1938).

[2] See Majumdar's *Explorations in Sind* (*Memoir Arch. Survey of India* No. 48, 1934).

[3] So named by Majumdar, op. cit. Little can be said about these people, as so far we have only their pottery. At Chanhu-daro there is no trace of their dwellings. They are certainly later than the Jhukar people.

are all familiar with the exception of one, or at the most two. The pottery of the Harappa levels presents essentially the same patterns as at Mohenjo-daro. All novel features are carefully described. Perhaps this is an opportune place to make the statement, that the volume as a whole is a model of painstaking, accurate description.

Just as at Mohenjo-daro, at Chanhu-daro too, the lower levels of the Harappa Culture give unmistakable evidence of greater prosperity. Better buildings and finer wares show conclusively that in the earlier periods the inhabitants of the city were better off than their descendants. Nothing thus far discovered at Chanhu-daro is likely to upset the generally accepted chronology of the Harappa Culture. On the other hand Mackay suggests the possibility of equating the major flood strata in the two cities Mohenjo-daro and Chanhu-daro, as this might shed much light on the history of occupation of these cities (pp. 18-9).

Above the levels of the Harappa Culture come the levels of the Jhukar occupation. Mackay believes that Chanhu-daro was finally deserted by its Harappa inhabitants about 2300 B. C., and that the Jhukar people came in about 1700 B. C. or perhaps a little earlier. Admittedly these dates are quite tentative. Who were the Jhukar people? This is another mystery to be solved. Certainly, they had a well defined culture of their own, even though they seem to have been much poorer in material possessions than their predecessors at Chanhu-daro. It is also doubtful whether they knew writing, for none of the seal-amulets found in their levels are inscribed. Incidentally, not a single one of the Jhukar seals illustrated in this volume has the representation of the unicorn; this must have been a distinctive feature of the Harappa civilisation.

The Jhukar pottery is quite distinctive and there is a very marked difference in the pattern of design and color-scheme between it and that of Harappa. On the other hand there seems to be considerable similarity between the wares of Amri and Jhukar. Does this raise some doubt as to the relative chronology of the three cultures? So far as I know, only two sites are known where Amri and Harappa Cultures occur together. At Amri, according to Majumdar, there is quite definite evidence that the Amri Culture is the earlier one. But at the second site, Ghazi Shah, the two cultures overlap. Of course both sites are known only from trial-excavations, and thus the picture is far from complete. And so far as the Jhukar Culture is concerned, it is known likewise only from two sites, Jhukar and Chanhu-daro. In any case, Mackay himself points out the possibility that the Harappa people might have formed colonies in and among a predominantly Amri Culture.

On the other hand Mackay is strongly impressed by a number of similarities existing between the Jhukar pottery and that of Tell Halaf! Considering the distance involved and the apparent chronological gap, this would appear to be a coincidence, but who knows!

A series of special chapters by A. S. Hemmy, A. R. Hall, G. M. Allen, F. J. F. Shaw, W. J. Clench, A. Lucas, W. M. Krogman and W. H. Sassaman complete the volume in a fitting fashion. The last two named scholars contribute an interesting study of the only skull found in the Harappa levels of Chanhu-daro. Their conclusion is that this is 'a Proto-Mediterranean type in which ancestral Negroid traits have manifested themselves.' This agrees pretty well with similar studies at Mohenjo-daro. It is interesting to note that skulls and skeletal remains have been very few in the levels of Harappa Culture. The cemetery at Harappa apparently belongs to another civilization. Does this scarcity prove, as has been suggested, that cremation prevailed in the cities of the Harappa Culture?

The book is excellently illustrated, and the drawings by Mrs. N. de G. Davies, Miss S. E. Chapman, and Mrs. Mackay deserve equal praise. Without wasting many words, the volume in its careful scholarship, as well as in its fine appearance is a fitting memorial to the recently deceased scholar.

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L'Arabo parlato a Ṣan'â'. By ETTORE ROSSI. Pubblicazioni dell'Istituto per l'Oriente. Pp. vi + 250. Roma: ISTITUTO PER L'ORIENTE, 1939.

Ettore Rossi undertook two voyages into Yemen in 1936 and 1937, and as a result of his linguistic research he wrote two articles: *Appunti di dialettologia del Yemen,* in Rivista degli Studi Orientali 17. 230-65 (1937), *Nuove osservazioni sui dialetti del Yemen,* ib. 17. 460-72, and finally his book *L'Arabo parlato a Ṣan'â'.* For the study of the Yemenite dialect, we have at our disposal texts published by Glaser, Burchardt-Mittwoch, Goitein, a vocabulary of the dialect of Aden by Stace (for detailed indications, see Rossi, *Appunti* 231-2; he omitted to mention Yahuda, *Yemenische Sprichwörter aus Ṣan'â,* in ZA 26. 345-58 (1912)), but so far we had no systematic grammatical description of any of the Yemenite dialects. Rossi is the first to give a systematic description of the dialect of Ṣan'â, the capital of Yemen, in his book which contains: Grammar, p. 1-46; Texts, p. 48-134; Lexicon, p. 135-89; Index Italian-Yemenite, p. 190-246.

I. Grammar. It is the smallest part of the book, chiefly because the author, assuming that the reader has a knowledge of the classical Arabic, limits himself to a mere description of the dialect. However, the reader would sometimes like to have more details and explanations, especially in cases where the phenomena of Yemenite differ from those of classical Arabic on the one hand and of spoken Arabic dialects on the other. But in general, one will find in the book information on nearly all problems which are of interest for the study of Arabic dialectology.

P. 3, § 4 note 1. Rossi says: the final *-eh, -ê* of the noun becomes *-äh, -ah, -â'* when it is in the construct state, but the cited example *gîmät älkitâb* "the price of the book" (from *gîmeh* "price") proves that *-êh* becomes *-ät* in the construct state, as it is stated by R. himself in § 26 n. 3.

P. 4, § 6b. It is interesting to note that ' is pronounced ' in the Tihâmah, which throws some light on the same phenomenon in Mehri (Modern South-Arabic).

§ 6d. R. states that *g* is sometimes labialized (*g*^{w}), but what about *k*? According to Goitein, *Jemenica* XIV, *k* is also labialized (*k*^{w}).

P. 5, § 7. To the examples of regressive dissimilation add: *d* + *ḏ* > *ḏḏ* in *gäḏ-ḏâ* for *gäd-ḏâ* (p. 71. 9-10). It is correct that *d* + *t* > *tt,* but by progressive assimilation it becomes also *dd,* as in *-ddarab* "to fall" (p. 197 under "cadere").

Add, too, some examples of partial assimilation in *t* + *z* > *dz* (*yidzawwäǧ,* p. 72. 15), but remains also *tz* (*yitzâwwäǧ,* p. 72. 14), and of *ṣ* + *t* > *ṣṭ* in *ṣṭabah* (p. 218 under "mangiare").

P. 6. Interchangeability of *r* and *l* in Yemenite itself is found in *mašrû'* and *mašlû'* "vestito con cura" (p. 206 under "elegante").

P. 9, § 13. The article is always noted by R. *äl* (without '). Considering the tendency of the dialect to pronounce even a non-etymological ' (§ 6e), it is probable that the ' of the article is pronounced, even if not written by Rossi, but we would like to have it stated that the ' though not written by convention, should be pronounced.

§13. 3. It should not be generalized that the article has the value of the demonstrative "this." In fact, it results from the examples cited by R. that it is the case only with the expressions of time.

P. 12, § 19. It is not correct that the suffix *-ât* is added to singular, feminine to form the plural; it is preferable to state that *-ât* is added to the basis of the singular not provided with any ending, thus: sg. *mislim-eh* : pl. *mislim-ât.*

P. 14, § 19. 3. It should be specified that the form *fu'wäl, fi'wäl* is the plural only of singulars with a long vowel. Thus: *ṭarîg* "road" : *ṭurwäg,* and so on. For the *w* instead of the classical ', see Rossi § 10.

20. The ending *-ī* which serves to form what is considered by R. as the noun of unity (*ġurrâb-ī* "raven," collective *ġurrâb*) is not to be separated etymologically from the same ending which forms the *nisba,* even in cases in which the singular with *-ī* is opposed not to a collective, but to a plural, as in *'ûdī* "piece of wood" from the plural *'idân, šiǧnī* "twing," plural *'ašǧân.* In fact, these forms (p. 15) should not be put in relation with the form of the plural, but with those of the singular *'ûd, šiǧn* etc.

The ending *-ī* in the abstract and verbal nouns, as *nukrī* "il diniego, l'azione di negare," *suḫrī* "corvée," *ḏulmī* "oscurita" causes some difficulties.

It should be added that the ending *-ī* is also found in the active participle, as in *ṭâmi'ī* (p. 194 under "avido"), *dâḫilī* (p. 207 under "estero"), and in the nouns of profession, as in *ḥammâmī*

(p. 194 under "bagno"). This form is considered by Goitein, *Jemenica* XXIII § 21c as a normal one. The form *qattâli, qatâli* is also found in other Arabic dialects (Marçais, *Le dialecte arabe des Ulâd Brahim de Saida*, p. 115) and in Ethiopic.

P. 17, § 24. 2. It is very doubtful that the ending *-ī* represents the diminutive in the three examples cited by R.: *gurgušī* from *garguš, buṣlī* from *baṣal, zugzugī* from *zugag*. It is rather the vowel *u* in the interior of the root which serves to express the diminutive; the ending *-ī* serves to express the noun of unity (see § 20).

P. 19, § 26 note 4. Note that *'aḫû-* followed by a substantive has the meaning of "proprietor of...," in *'aḫu l-bilzigī* "il compagno del braccialetto" (P. 82. 19, 83. 13, 17).

Concerning *'abû-* it is interesting to point out that the final *-û* is used even in cases where we would perhaps expect *-ī*, as in *min bâb bäyt 'abûha* "from the door of the house of her father" (p. 92. 16).

§ 27. For the omission of the final *-m* in *'antū* "you," cp. Botahari and Harsusi (Modern South-Arabic). In the dialect of Palmyre, the forms are *'önto^u* "you," *'ohū* "they" (Cantineau, *Le dialecte arabe de Palmyre* I, p. 110). However, the dialect of Ṣan'â preserves the final *-m* in the suffixed pronoun of the 2nd person plural *-kum*.

An interesting use of *'anê* is found in the expressions *silfi 'anê'* or *'âdati 'anê'* "my habit" (p. 244 under "uso"), *'anê'* serves to reinforce the meaning of the noun with the suffixed pronoun. It reminds one of the use of post-biblical Hebrew; in Arabic, too, this construction occurs.

It should be pointed out that *'iyyâ* with the suffixed pronouns is used only in enumeration preceded by the ordinary personal pronoun: *'anê' ū-iyyâk* "I and you" etc.

P. 20, § 28. The suffixed pronouns for the plural should be indicated as follows:

1st	*-ana* (*-na*)
2nd masc.	*-akum* (*-kum*)
2nd fem.	*-akin* (*-kin*)
3rd masc.	*-ahum* (*-hum*)
3rd fem.	*-ahin* (*-hin*)

as it is rightly indicated by R. for the singular taking into consideration that the forms in parentheses apply to nouns ending in a vowel.

The suffixed pronoun of the 3rd sg. fem. is given as *-ahā* (*-hā*), but in all the cited examples the suffix is *-ähä* (*-hä*): *bäytähä* "her house," *šagâhä* "her work," etc.

P. 21, § 30. It should be indicated that the demonstrative pronoun, as it results from the examples given on p. 22, is followed by the noun with the article.

These expressions for "ecco" (p. 206) with the pronouns: *hūḍāhû, hīḍāhī*, etc., can be added here.

P. 22, § 32. The relative pronoun *allāḍi* is written in Burchardt-Mittwoch, *Aus dem Yemen*, p. 58-9 and passim, *alāḍi* (with one *l*) and is also used for the plural.

P. 24, § 36. For *ṯamân* "week" (from the root *ṯmn* "eight"), cp. the similar expressions in Ethiopic (from the root *smn* "eight"); Stace, *An English-Arabic Vocabulary* (dialect of Aden), p. 186 translates "week" by *'usbū'* (from the root "seven").

P. 26, § 42. Note the ending of the 2nd masc. pl. *-tu*, without *-m*; see above to § 27.

According to the examples cited by R. the suffix of the 2nd and 3rd pl. should be *-täyn, -äyn* instead of *-tayn, -ayn*; the same is true of the 2nd and 3rd pers. pl. of the imperfect: *ta—äyn* instead of *ta—ayn*.

The distinction between *fa'al* and *fi'il* pointed out by Goitein, *Jemenica* XIX is not sufficiently underlined by Rossi.

P. 27, § 45. Note the variety of the vowels of the prefix of the imperfect: *a, i, ä, u, o* (*tišräb, täzgäm, tuḫriǧ, tiḫliq, toġläṭ*).

P. 28, § 46. 1. *kân* is often followed by *bih* in the meaning of "there was": *kân bih räǧǧäl* "there was a man" (p. 81. 2; 86. 21).

4. Concerning the element *ša-* prefixed to the imperfect to express the future or the intention, note that Tchaha (Guragué), too, uses the jussive followed by *ša* (Polotsky, Bull. Soc. Ling. 39, fasc. 2, p. 154) to express a kind of future. The Guragué *ša* is explained by the root *ša-m* "to want" as the Yemenite *ša* was explained by the root *šā'a* "to want" (Landberg, *Arabica* III. 109). However, one is tempted to put the Yem. *ša* in relation with the classical Arabic *sa-* prefixed to the imperfect to express the future.

P. 29, § 47. The ending of the 2nd pers. pl. is probably *'a—äyn* instead of *'a—ayn*.

One would like to know whether the initial ' of the imperative is a waṣl, that is whether it is pronounced after a word ending in a vowel or not. The example of *ū-'urgud* "and sleep" (p. 52. 10)

might lead one to the conclusion that the ' is not a waṣl which is in opposition with what we know of classical Arabic.

Concerning the waṣl note that one finds in Ṣan'āni *ma 'ismiš* "what is your name?" (78. 21) with ' expressed whereas in classical Arabic the glottal stop would not be expressed, unless *ma* should be pronounced *ma'*.

P. 30, § 50. The imperfect and the active participle of the intensive stem are indicated as *yifa"il, mufa"il,* but the cited example *yiṭallub, muṭallub* has an *u* after the 1st radical. In fact, the form is *yifa"il* and *yifa"ul*: see p. 234 under "sapone," 235 under "scalpellare," 236 under "segnare," 239 under "sprofondare."

P. 31. The form *istif'âl* of the 10th is a mistake; it is without doubt a verbal noun and not the perfect, the form of which is *staf'al*: *stakbar* (p. 31), *sta'mal* (p. 58. 4) etc.

P. 32, § 51c. A verb formed secondarily from the imperfect of an original *Iw* is *zân* "to weigh" beside *wazän* (p. 227 under "pesare").

P. 33, § 51e. It would be preferable to distinguish more clearly between verbs with 2nd rad. *w* and those with 2nd rad. *y* because of the different vocalization of the perfect and the imperfect. Thus 2nd *w*: type *fa'al*: *gâm, gumt, yigûm*; type *fi'il*: *ḫof, ḫoft, yiḫaf*; verbs with 2nd rad. *y*: *sâr, sirt, yisîr*. The same holds true of verbs with 3rd radical *w*, or *y* of p. 34.

P. 36, § 53. The form *fi'il* of the passive is interesting; it reminds one of the form *qitil* of Soqoṭri.

P. 38, § 56. 5. One would like to know whether *zîd* (of verbal origin) which prefixed to a verb expresses "still, again," in negation "no more" is conjugated or not. From the different examples cited by Rossi it seems that both possibilities occur. Thus in concordance with the principal verb: *mā zidt-š libisät* "she did not dress any more" (p. 72. 3), *lăw zidt ta'ûdī* (p. 82. 14), but without concordance in *mā zid 'absarnâh* "we did not see him any more" (§ 56. 5). The ending *t* in *mā zidtš 'absarnâh* (p. 73. 1) is difficult to explain. The verb *zâd* is also used in the imperfect followed by another verb in imperfect to express "still," in negation "no more": *lâ 'azîd 'a'ûd* "I shall return no more" (p. 82, 14).

P. 40, § 59. 3. The preposition *lā, la* is often followed by *'ind*: *näbbi bī la-'ind äl-ḫwâğeh* "annunziami al signore" (p. 60. 3, 67. 26 and passim).

11. The derivation of *ṣālâ* "till, toward" from *ṣā* or *sā* and (*i*)*lâ* seems to be doubtful; one might think of the root *wṣl* "to arrive."

One misses the preposition *tebet* "to, toward" often mentioned in Burchardt-Mittwoch (see p. 67, note 15).

P. 41, § 61 note. It is not clear whether in the plural *gâd* is also used with the suffixed pronouns, and not only with the personal pronouns. This particle is written *godd* (with geminated *dd*) in Burchardt-Mittwoch.

P. 42, § 61. 4. For *bih* combined with *kân*, see above to § 46. 1. "There is" is also expressed by *ši bih* (p. 55. 36).

§ 62. It is correct that the negation is expressed by *mā—š*(*i*) but it should be stated that *-š*(*i*) is not obligatory, as said p. 37 § 54, and as results from the examples of p. 42.

P. 43, § 63. Add to the conjunctions: *mašî* "unless" (88. 12 and passim), and perhaps also *yäs'am* "as if" (72. 27) of verbal origin. Add, too, the particle of vocative *yā* for which there are many examples in the texts. Note especially *yā dawlatā* "oh sir," the noun being pronounced with *-tā* for reasons of emphasis, as in classical Arabic.

P. 44, § 64. 3. The repetition of an element often serves to reinforce the meaning: *hū ġâlī gawî gawî* "it is very expensive" (p. 59. 19); it is very curious, however, that p. 193 under "assai" *gawî-gawî* is translated by "enough"; *'alâ l-bäyt lâwī lâwī* "all around the house" (p. 194 under "attorno"), *sawâ- sawê* "exactly" (p. 207 under "essattamente").

P. 45, § 65. To the interjections, add *ra'ī* "here he is!" (p. 116. 7).

II. Texts. The texts contain sentences, dialogues, proverbs, puzzles, tales in prose, texts related to the customs and ceremonies of Ṣan'a (as the punishment of the guilty, Ramaḍān, ceremonies of wedding, and so on), songs, folk-poetry, military songs, and lullabies. The texts are given in transliteration and translation.

P. 47. Beside *bi smiš* "what is your name?" (fem.) one finds also *ma 'ismiš* (p. 78. 21).

P. 71. 7-8 *wal-märet . . . tmäywät* is not translated by the author.

P. 88. 5 *'uṭla'ī ra's äl-ğubê'* is not translated.

III. Lexicon. The lexicon is arranged according to different subjects: government, measures, instruments, clothes, animals, geographic names, etc. In each subject, the words are indicated in the alpha-

betic order either in Italian-Arabic or Arabic-Italian. One would like to see mentioned, among the treated subjects, the names of the members of the body, and the religious expressions. What we greatly miss above all, is a Yemenite-Italian dictionary in alphabetic order, and not according to the subjects; this would have been the first Yemenite dictionary. However, as it is, the lexicon of R. is very useful, first because of the rich vocabulary, and secondly because of the ethnographic, social and political information given by R. à propos of the cited words.

P. 175. For "brother" we find also *ṣunw* (p. 58. 32).

P. 183. The word *zâr* "una specie di genii malefici" known in Egypt and in Mecca, coming from the Ethiopian world (the word is of Cushitic origin, see Cerulli, Enc. Islam, art. Zâr) is also encountered in Yemen.

IV. Italian-Yemenite Index. For every verb, the author cites the perfect and the imperfect; for every noun, the singular and the plural. There are, however, words mentioned in the body of the book which are not cited in the Index. I mention only: contadino, delicate (p. 104. 19), portare in giro (92. 19), mondare il campo (89. n. 3), tirare a sorte (86. 29) etc. Under "cantare (di uccelli), add *tzärgäm* (p. 120. 24). The form *mikttäb* (= *mikättäb*) of p. 215 under "scritto" seems to me doubtful.

From the Index as well as from the Lexicon, one gets an idea of the loan-words in the Yemenite dialect. Many of them, especially those of the military domain, are of Turkish origin, such as: *'âskī* "veteran," *gaṣṭûrah* "bayonet," *fišik* "cartouch," and many others. Among the loan-words of the European languages I cite only: *širingeh* "injection," *šigâreh* "cigarette," *lambeh* "lamp," *mowtor* "car," *bisiklêt* "bicycle"; the initial "el" of "electric" or "elettrico" was considered by the language as the article, hence *itrîk*, with the article *al-itrîk* (p. 206 under "elettrico," 207 under "fanale"). There is metathesis in *bafrîkeh* "marca di fabbrica" (p. 218), and probably also in *fanîliyeh* "flanella" (p. 209). The phoneme *p* is pronounced *b* in Yemenite: *bumbeh* "pompa," *boṣṭah* "posta, lettere giunte per posta," *sbanâk* "spinach," etc. A popular etymology is found in *ṭayr äl-hawê'* "radiotelegrafia" (p. 231), properly "bird of the air," for *ṭâr* (or *târ*) *äl-hawê'* "wire of the air," from the Persian *târ* "wire."

One will find p. 195 under "bambino" an interesting enumeration of some infant words for "water, bread, father" etc. The child's word *nīn* (Soqoṭri *nin-hin* "brother," perhaps also Hebr. *nīn* in *nīn wånęḳęḏ*, Leslau, *Lexique Soqoṭri* 268) is also found in the Yemenite *nîni*, fem. *nîneh*, caritative expression for "baby." It is the same word which means "apple of the eye" which reminds one probably the Hebr. expression *baṯ 'ayin*, Ethiopic *bənta 'ayn*.

One will also find some slang expressions, as for "poor": *watîd, sîdi Ḥasan, šilḥ, 'Abî Hâdi, gil'* (p. 228 under "povero"); "beautiful girl": *ġuṣn mâyis* "ramo di maggio" (p. 232 under "ramo"); "readily, with pleasure": *min äl-gûrgureh, gûrgureh* being a slang expression for "head" (p. 275 under "volontieri").

Among the curiosities of the vocabulary I would like to mention: *dâḫilī* "external" (normally in Arabic "internal"), from *daḫal* "to enter," then "to enter into a ship, the sea," hence "to go abroad, to go out"; *'adanī* "southern," from the city of Aden which is in the South of Ṣan'a.

A root which might interest epigraphic South-Arabic is *waṯan* "tombstone" (p. 242 under "tomba").

Secondary roots are: *'abḫan* "more quickly," from *bä-ḥîn* "in time" (p. 229 under "presto"); *baḫäyr* "happy," plural *baḫäyrîn*, verb *baḫḫar* and *tbâḫar* "to heal," from *bä-ḫayr* "in happiness"; and perhaps also *yäs'am* "that is," imperfect of *s'm* formed from *sâ' mā* "like."

Considering the important number of texts in transliteration, the mistakes are not numerous. I cite some of them: P. 30. 19 to read *yiṭallub*, for *yitallub*; p. 42. 21 noi for voi; p. 54. 14 *ma'aḫḫireh* for *ma'aḫḫireh*; p. 54. 23 *'anê'* for *'anê'*; p. 56. 26 *'ant* for *'ant*; p. 59. 31 *tfåḍḍal* for *tfåḍḍal*; p. 65. 12 *taḥt* for *ṭaḥt*; p. 75. 26 *'abî* for *'abî*; p. 82. 22 *šiǧareh* for *siǧareh*; p. 87. 5 *gāmîṣ* for *gāmîs*; p. 95. 12 *'abû* for *'abû*; p. 161. 37 *'arnabeh* for *'arnabeh*; p. 218 under "mano" *yädd* or *yäd* for *yädd* or *yädd*; p. 240 under "stuoia" *ḥaṣîrah* for *ḥasîrah*.

To sum up: the book of Rossi is a useful and important contribution to our knowledge of the dialect of Ṣan'a.

WOLF LESLAU

ECOLE LIBRE DES HAUTES ETUDES
NEW YORK.

Excavations at Deir el Bahri: 1911-1931. By H. E. WINLOCK. Pp. x + 235, with 96 plates. New York: THE MACMILLAN COMPANY, 1942.

This volume contains no essentially new material but is a re-editing of articles by the author published in the Metropolitan Museum *Bulletin*. Notice of these articles has been taken as they appeared (in, e. g., the *Journal of Egyptian Archaeology*). The reasons for re-editing are stated in a charmingly personal preface. The changes made in re-publication are also outlined.

Briefly stated, the purpose is to present in a unified form material hitherto scattered in reports covering thirty years of publications and to make this available to a much broader group of readers. This purpose is admirably fulfilled. In the process inconsistencies in the spelling of Egyptian words were levelled out, repetitions and other unnecessary passages deleted and minor errors corrected. Although the author states this in his preface, only a comparison of this volume with the original *Bulletins* gives an adequate picture of the work. Nearly all of the cutting has been done with no loss and a gain in conciseness. Much material necessary in an article intended to report progress regularly to a group of waiting readers is profitably omitted.

The advantage of greater perspective in re-editing published material covering such a length of time is obvious. The author has made good use of this both for occasional personal observations and for correcting mistaken theories published at the time of excavation but later revised by new evidence. The footnotes contain fuller bibliographical material than the *Bulletins*. An index has also been added, greatly increasing the usefulness of the whole work.

For those unacquainted with the *Bulletin* accounts it should be said that this is a season by season account of the Metropolitan Museum's excavations at Deir el-Bahri. (It should be noted, however, that the present book deals with those excavations in which the author took part. This does not include the short period of 1914-19, which is given about half a page only, the reader being referred to the *Bulletin* accounts by White and Lansing.) The two major periods illumined by these are the Eleventh and Eighteenth Dynasties, although much material, particularly of later date, was found. The Eleventh Dynasty Temple area and causeway together with the tombs of several princesses were investigated. Our knowledge of the Eighteenth Dynasty Temple of Queen Hatshepsut has greatly profited. The innumerable fragments of statues found in these excavations now show us the temple almost alive with images of the queen as Osiris, as a sphinx, as kneeling with offerings, etc. Tuthmosis III's vandals had smashed these to bits, but a careful reconstruction has made possible a far more complete picture of the original temple. Many late (Saitic and Ptolemaic) tombs were found, yielding a fine collection of sarcophagi as well as other items.

The volume is very well illustrated with fourteen maps, plans and drawings in the text, maps on end papers, and 96 plates at the back of the book. The plates are placed in chronological order as regards Egyptian history rather than in the order in which the finds were made. (A few errors of labelling have crept into the plates, e. g. plate 30 is 1919-20, 1919-20, 1940, 1913-14 and plate 34, 1925-26 and 1912-13.) Not all the original photographs are included.

Although this present book does not entirely replace the *Bulletin* account, it confines references to it to the few odd pictures otherwise unavailable and other minor matters. It serves a very useful purpose in putting the whole in a handy volume which is essential to the Egyptologist's library and a very commendable one to scholars in allied fields or to the layman. It should be added that a number of the *Bulletins* from which this material is taken are now out of print.

CARLTON T. HODGE

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NOTES OF THE SOCIETY

The total number of votes cast for new officers of the Society was 218. Several nominations in addition to those presented by the Nominating Committee were received. In no case, however, were as many as three nominations of the same person for the same office received. The votes were tabulated by President L. Bloomfield and he has declared that the candidates as presented by the Nominating Committee were elected. The list is printed in the Journal Volume 63, page 298.

The following persons have been elected to Corporate Membership as of January 1, 1944:

Mrs. F. O. BLACKWELL, 60 Chestnut St., Englewood, New Jersey.

Dr. HERBERT H. STROUP, Department of Sociology and Anthropology, Brooklyn College, Brooklyn, New York.

Miss GRACE EDWARDS, M.A., 5757 Woodlawn Ave., Chicago, Illinois.

Mr. PAUL FORCHHEIMER, 3500 Devonshire Drive, Baltimore 15, Md.

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Capt. RICHARD A. GARD, USMCR, 937 15th St., Boulder, Colorado.

Mrs. JACQUELINE MARGOLIASH, 536 W. 114th St., New York, N. Y.

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FIRST SECRETARY, Indian Agency General, 2633 16th St., N. W., Washington 9, D. C.

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Dr. R. O. STEUER, Department of Medical History, University of California, San Francisco, California.

Captain BEN BRUCE BLAKENEY, Intelligence Department, AAFSAT, Orlando, Florida.

Miss CHAO SUM-MUY, c/o R. M. Young Apartment, 36 Bethune St., New York 1, N. Y.

NOTES OF OTHER SOCIETIES

INTERNATIONAL JOURNAL OF AMERICAN LINGUISTICS

The *International Journal of American Linguistics*, edited by the late Franz Boas of Columbia University, is now to be continued. Publication will be resumed by Indiana University under the auspices of the Linguistic Society of America and of the American Anthropological Association. The new editor will be C. F. Voegelin, with associate editors continuing: Paul Rivet, C. C. Uhlenbeck, William Thalbitzer, and Leonard Bloomfield.

Beginning with the summer quarter of 1944 the *Journal* will appear as a regular quarterly. It will aggregate about two hundred and fifty double-column pages annually. Other than this, it is planned to continue the general policy of the *Journal*, as edited by Franz Boas, without substantial change.

Subscriptions (Four Dollars a year) will be received by the business manager, Stith Thompson, Indiana University, Bloomington, Indiana.